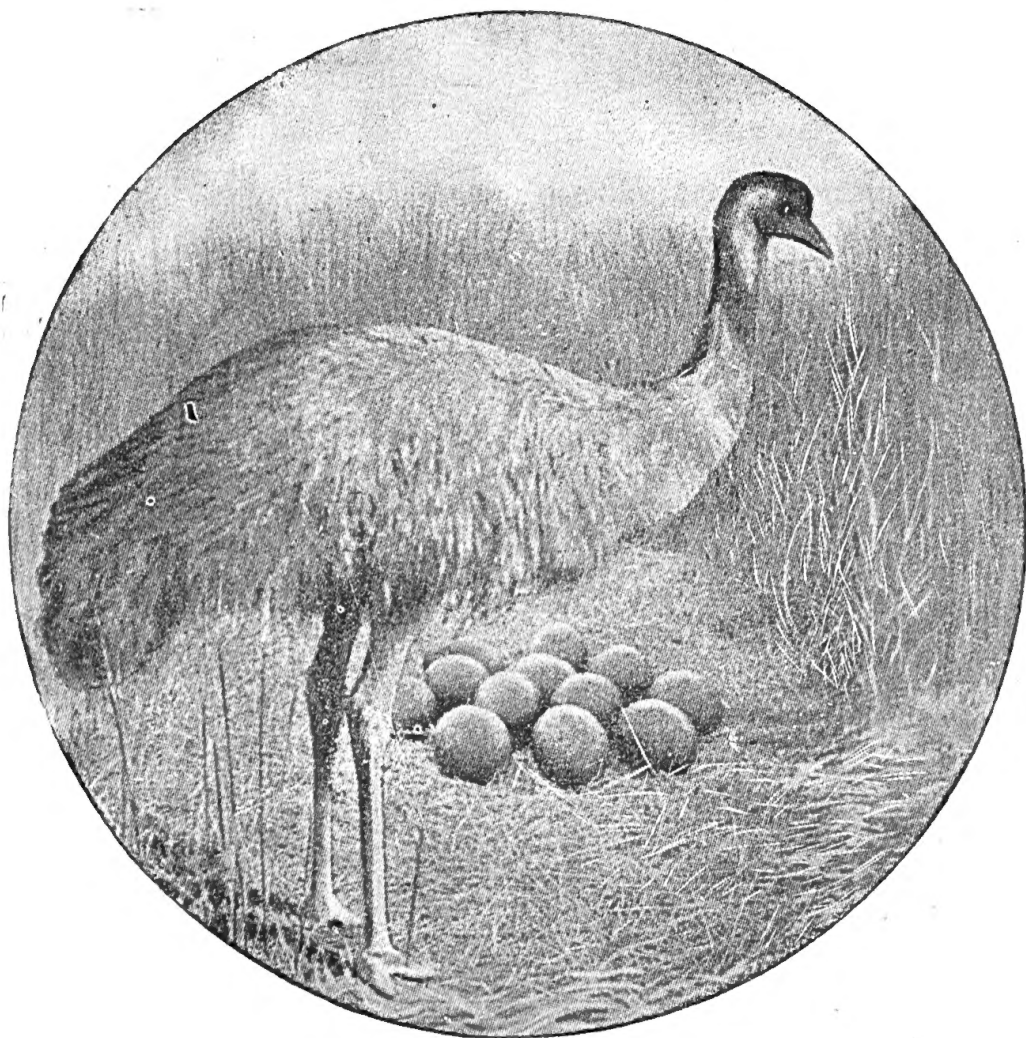




The Emu ⁹⁶/₁₅₁

A Quarterly Magazine to popularize the Study and Protection of Native Birds and to record Results of Scientific Research in Ornithology.

VOL. XXIII.—1923-24.



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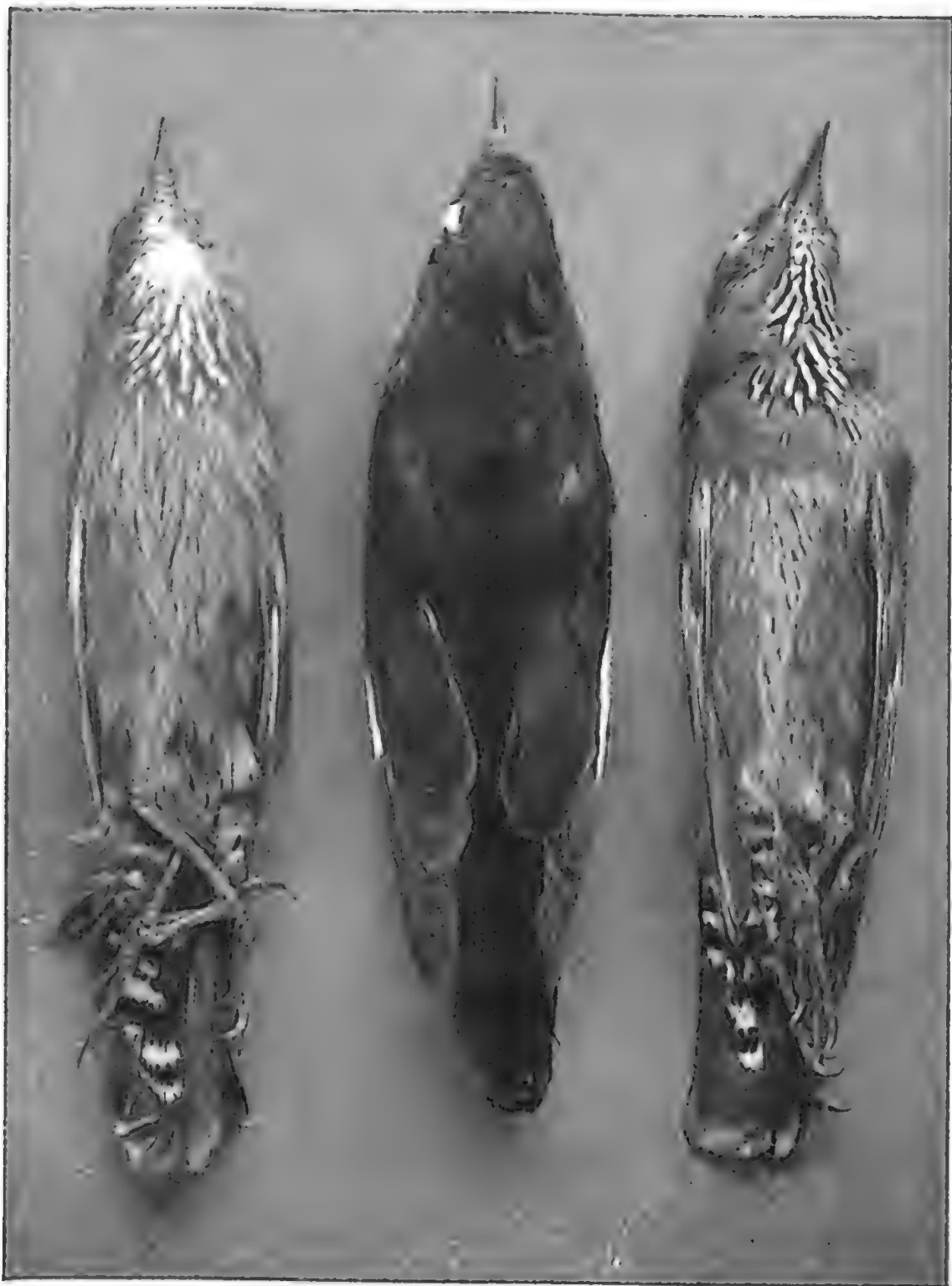
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THE ALLIED TREE-CREEPER
Climacteris wellsi

Left—Female

Middle—Male

Right—Male

The Emu

Official Organ of the Royal Australasian Ornithologists' Union

"Birds of a feather."

VOL. XXIII.]

1ST JULY, 1923.

[PART 1.

Tree-creepers of the Genus *Climacteris*

By A. J. CAMPBELL, C.M.B.O.U., F.A.O.U., Ex-President
R.A.O.U., Bulgaroo, Wellington Road, Box Hill (Vic.).

The accompanying coloured plate represents plesiotype specimens of the Allied Tree-creeper *Climacteris wellsi*. The letterpress may be referred to in *The Emu*, vol. xxii., p. 257.

While on the subject of Tree-creepers, it may be mentioned that an interesting specimen has been brought to light, namely, a skin of the Rufous Tree-creeper, *Climacteris rufa*, collected by Gilbert, at Perth, W.A., 1842. The skin came into the possession of Mr. Outram Bangs, F.A.O.U., Cambridge, Mass., America, who generously forwarded it to the R.A.O.U. through Mr. W. B. Alexander, M.A., C.F.A.O.U. The Council has decided, after grateful acknowledgment, to add the historic specimen to the "H. L. White Collection," National Museum, Melbourne. The skin bears the original label, which reads:

"*Climacteris rufa*, Gould. Irides Reddish Brown."

There is also a registration number in red ink—2716.

On obverse side—

"Male, Oct. 22, 1842. Perth, Western Australia."

Gilbert's type of *C. rufa* was collected in 1840, and was described by Gould in *Proc. Zool. Soc.* (London), 1840, p. 149. Gilbert evidently collected this other skin, which may now be regarded as a plesiotype, when he returned to Perth, 1842.*

The specimen appears to be slightly darker, or duller, in coloration (general under-surface tawny) than present-day specimens, but not so dark (under-surface russet) as the South-west Forest birds, which Mr. T. Carter collected and designated *C. rufa obscura* (*Bull. B.O. Club*, vol. xxvii., p. 16).

The following are the dimensions in millimetres of the Gilbertian specimen: Length, 160; culmen, 14; wing, 86; tail, 57; tarsus, 24.

Although over 80 years old, the skin is in a wonderful state of preservation—a silent tribute to the skill of the collector.

* Campbell, "Nests and Eggs of Australian Birds," p. x.

The Wing Markings of the Black-Backed Magpie (*Gymnorhina tibicen*)

By HENRY L. WHITE, C.F.A.O.U., Belltrees, Scone.

For a considerable time I was puzzled by the fact that apparently some birds carried a large boomerang-shaped white mark on the wings, while in others the white marking was represented by a narrow line only. At first I took the larger marking to be a sign of maturity, but soon noted that young birds carried it also. As no observer, as far as I know, has recorded the fact, I decided to make careful observations.

For many years (*vide The Emu*, vol. xxii., p. 149), when the winter has been severe, I have fed the wild birds near my office; but I now placed the feeding board right under my window, and about 20 feet away. During the present winter, one of the worst on record, Magpies have turned up in dozens, forty-five being present on one occasion. My trouble was soon rewarded by the solving of the problem.

Every bird, young and old, showed the large white marking (about 7 by 1½ inches) upon first alighting, but within a space of three to five minutes this was replaced by the thin line; in some cases hardly visible.

When on the ground, or perched, the black feathers of the back were gradually spread until they covered practically all the white wing-markings.

Gould depicts a bird showing the white markings and standing on a branch near the nest ("Birds of Australia," vol. ii., plate 46), where it had probably recently alighted. This is correct as far as it goes, but my idea is, seeing that the Magpie spends most of its time on the ground, the correct method of drawing should illustrate the thin band of white only.

The accompanying photos. (see plates 2 and 3), taken from close to my office window, will illustrate my meaning; the two right hand birds in one of the pictures having just alighted, while others have been at the food for a longer period.

My wild birds now pick clean the neck bones of three bullocks per week, in addition to several livers. Amongst the regular guests is a fine bird showing no white neck patch.

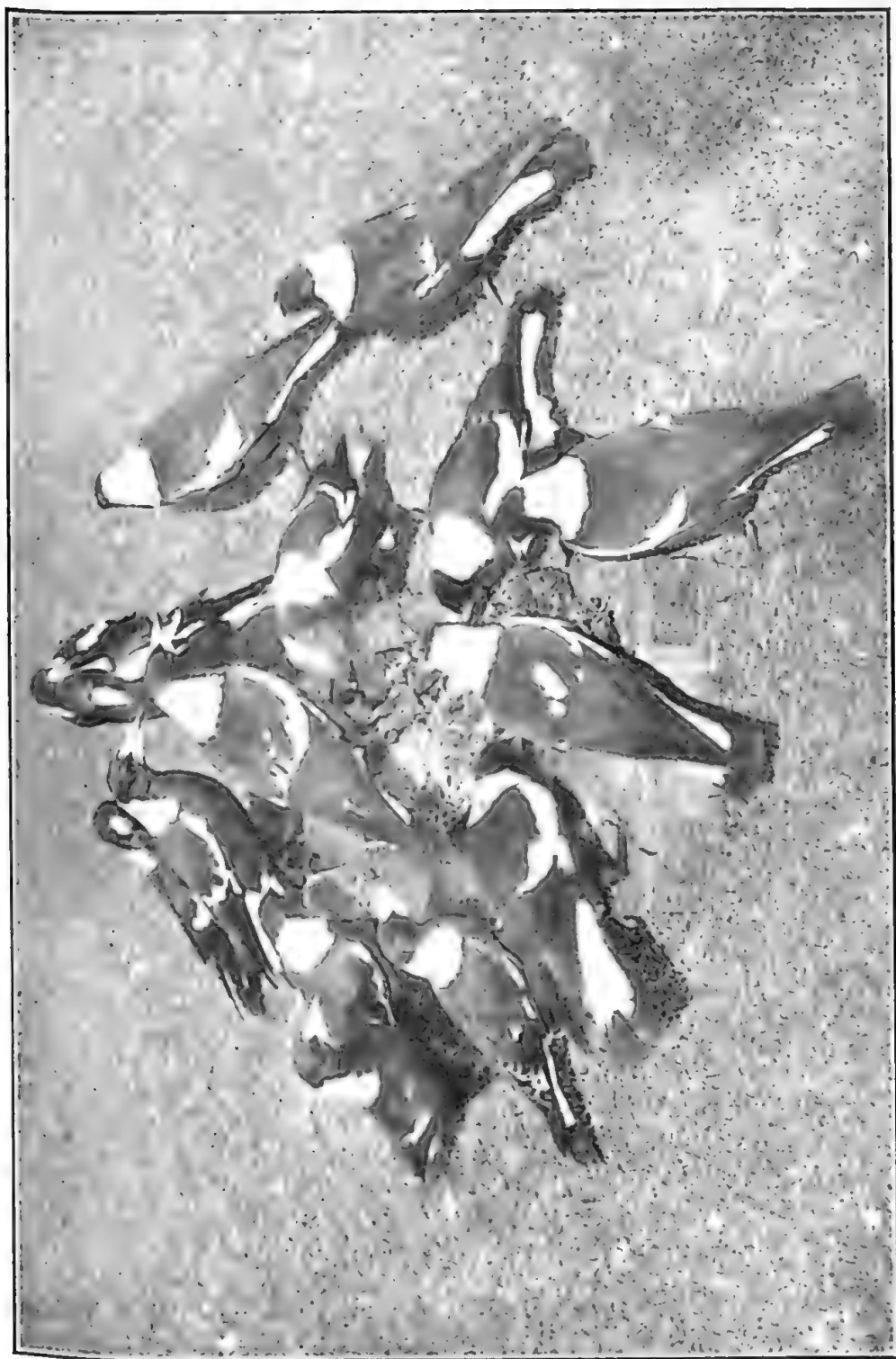
As an illustration of how pushed the Magpies are for food, I notice they are eating quantities of seedling "trefoil," started by a recent light fall of rain.

A friend at Singleton (60 miles away) has a fine pair of pure white Magpies in captivity; they have brown eyes, dark legs, and no trace whatever of black markings.

In Mathews' last part ("Birds of Australia," vol. x., pt. 5), is shown a very poor figure of *Gymnorhina tibicen*, taken from



Black-backed Magpies (*Gymnorhina tibicen*) being fed at Belltrees, Scone, N.S.W., April, 1923.
Note the variable amount of white on the wings.



Wild Black-backed Magpies (*Gymnorhina tibicen*) being fed on the lawn at Belltrees, Scone, N.S.W.

Note the variable amount of white on the wings.

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the so-called sub-species *G. t. terra-reginae*. If this is the only illustration we are to have of one of our most popular and best-known birds, I do not think Mr. Mathews is to be complimented upon his selection of a type or upon the excellence of the drawing; the plate is unworthy of a great work.

The White Goshawk (*Astur novae-hollandiae*)

By HENRY L. WHITE, C.F.A.O.U., "Belltrees," Scone,
N.S.W.

About a month ago it was my good fortune to secure a beautiful live White Goshawk (a female apparently from its size), which now has a large flight aviary to itself. The bird was secured in this locality by a trapper, who disabled it while it was gorging on a rabbit recently secured; it recovered completely, was kept by the man for five months, and then passed on to me. I had previously seen four specimens only in the Upper Hunter district. I believe the bird is rare in Southern Australia, though more numerous on Cape York Peninsula.

I feed the Hawk on fresh bones and birds, Parrots chiefly, which it appears particularly to enjoy. Its manner of eating is queer: after alighting on the ground, it puffs out its feathers like a broody hen, while trailing its wings on the ground. When the food is grasped, the wings are extended so as to form props on either side, the meat being torn off in small pieces by the beak. Unfortunately, I have been unable to obtain a snap-shot. Gould states the color of the irides is fiery red; A. J. North, carmine; Mathews says most frequently bright yellow. I'll add another shade, *viz.*, dark brown, with no sign of red or yellow. Quite possibly my bird is not mature, but it must be considerably more than six months old. I shall note any changes that occur.

The only note it utters is a low, but distinct, "Queet, queet," usually given three, but occasionally more times, in quick succession.

The bird recognises a stranger at once, and becomes very restless, even to dashing into the wire netting.

Colour of the Raven's Eye.—Wishing to satisfy myself as to changes in colour of the eye of the Raven (*Corvus coronoides*), I secured a pair of young from the nest in August, 1920, keeping them under close observation in a large aviary. No alteration from the juvenile brown was noticed until towards the end of 1921, when the irides changed to yellowish-brown; in January, 1922, to dull golden; thence to dirty white, and in June to the adult china white, at which stage they have since remained.—H. L. WHITE, M.B.O.U., "Belltrees," N.S.W.

Comparative Osteology of the Australian Mud-builders.

(*Corcorax melanorhamphus*, *Struthidea cinerea*, and
Grallina cyanoleuca).

By Dr. R. W. SHUFELDT, C.M.Z.S., Hon. Member R.A.O.U.,
etc., Washington, D.C., U.S.A.

Sometime during the latter part of the year 1919, I received from the National Museum of Melbourne, Australia, a number of beautifully prepared skeletons of birds, all of which are represented in the existing avifauna of the Commonwealth. For the pleasure of performing the interesting task of describing these birds I am indebted to Sir Baldwin Spencer, K.C.M.G., M.A., F.R.S., the Honorary Director, and to Mr. J. A. Kershaw, F.E.S., the Curator.

Apart from a skeleton of a Wedge-tailed Eagle (*Uroaetus audax*), which I have already figured and described for *The Emu*, the remainder of this consignment consisted of semi-articulated skeletons of the White-winged Chough (*Corcorax melanorhamphus*), the Apostle-Bird (*Struthidea cinerea*), and the Magpie-Lark (*Grallina cyanoleuca*), all in excellent condition for osteological descriptions.

Outside of a few forms of which I had skeletons in my own collections, all the material for comparison with these Australian birds was contained in the now rapidly growing collections of the United States National Museum, at Washington. For the selection and loan of this I am indebted to Dr. Charles W. Richmond, the Assistant Curator of the Division of Birds of that institution; to Mr. Alexander Wetmore, of the United States Biological Survey, who is now engaged in rearranging the bird skeletons of the Division, and to Mr. J. H. Riley, Richmond's assistant, who kindly attended to other matters in connection with this loan. The list from the U.S. National Museum is as follows:—

(1) *Nucifraga columbiana* (Skel. No. 18788); (2) *Megascopus major* (Skel. No. 19377); (3) *Quiscalus purpureus* (Skel. No. 16708); (4) *Garrulus glandarius* (Skel. No. 224001); (5) *Pyrrhocorax pyrrhocorax* (Skel. No. 19705); (6) *Paroaria cucullata* (Skel. No. 223838); (7) *Struthidea cinerea* (Skel. No. 224841); (8) *Pinicola enucleator* (Skull No. 224599).

Apart from the small corvine forms found in this list, selected for comparison with the skeleton of the White-winged Chough

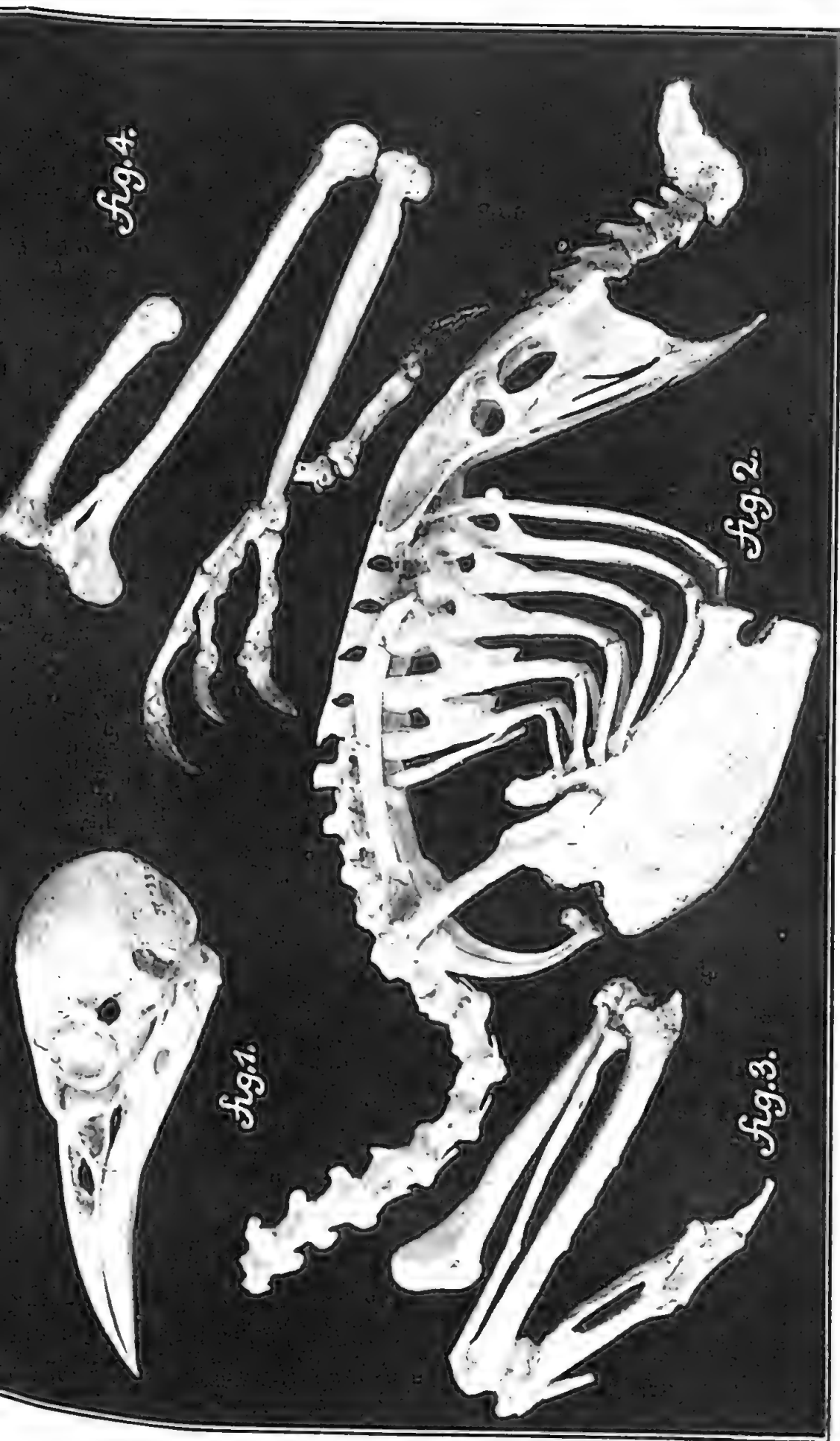


FIG. 1.—Left lateral view of the skull of the White-winged Chough (*Corcorax melanorhamphus*), mandible attached; Sclerotal ring held in position by a wire to the upper edge of orbit. FIG. 2.—Direct left lateral view of the trunk skeleton, same bird. FIG. 3.—Palmar aspect of left pectoral limb, closed; same individual as other figures in this plate. FIG. 4.—Left pelvic limb, outer aspect; all four figures reproductions of photographs made direct from specimens.

Photo by Dr. R. W. Shufeldt, C.M.Z.S., Washington, D.C., U.S.A.

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(*Corcorax melanorhamphus*), it will be noted that there is but little for such purposes in so far as the Apostle-Bird (*Struthidea*) and the Magpie-Lark (*Grallina*) are concerned. In fact, we have no birds in the United States avifauna that appear to be in any way particularly related to them, and no skeletal material is at hand for exhaustive comparisons of their osteology.

OSTEOLOGY OF *CORCORAX MELANORHAMPHUS*.

This is the skeleton of a female (adult) collected in Victoria (8/9/17), and entered on the catalogue of the Museum as (R. 7333) *Corcorax melanoleucus*. Dr. Leach, in his "Australian Bird Book" (p. 189, fig. 391), lists this species as *Corcorax melanorhamphus*, the vernacular names being the White-winged Chough, Black Magpie, Jay or Apostle Bird, and says of it that "The White-winged Chough has no close relative in the world; possibly the Chough that nests in the cliffs of Cornwall is nearest to it."

Sharpe, in his "Hand-List of Birds," places it as *Corcorax melanorhamphus* (the sole species), in the family *Corvidæ*, between the genera *Pyrrhocorax* and *Podoces* (vol. v., p. 628), while between the latter and such genera of Jays as *Cyanocitta*, *Aphelocoma*, *Xanthura*, etc., we find placed *Struthidea cinerea*—an arrangement that will be looked into a little further on in the present paper.

Some of my ornithological friends contend that *Pyrrhocorax pyrrhocorax* is the name of the common Chough, and that Dr. Sharpe, in the "Hand-List" (vol. v., p. 627) has confused *Graculus graculus* and *Pyrrhocorax alpinus*; but it may be that *Graculus graculus* is now *Pyrrhocorax pyrrhocorax*—a point for the systematists to settle.

Upon picking up and examining specimens of *Corcorax*, one would be very apt to say, off-hand, that the bird was some sort of a corvine type, standing in, with one character or another, with typical Crow birds, as the true Crows, Ravens, Choughs, Magpies, Grackles, and their near allies.

The Skull.—Upon comparing the skull of *Corcorax* with that part of the skeleton in any of the true American Crows of the genus *Corvus*, the relationship is readily seen. In *Corcorax*, however, the cranial vault is more globular, and the space between the orbits not so broad. In the Crow, too, we find the superior mandible to be much broader at the base; relatively shorter, and not nearly so much curved. The external narial apertures are likewise much larger.

But few differences are to be seen in and about the orbit, though it is well to note that in *Corcorax*, over either *pars plana*, the transverse vacuity for the passage of vessels and nerves is

a striking character, being far more patulous than in the skull of any Crow examined by me. In Clarke's Nutcracker (*Nucifraga columbiana*) it is replaced by the foramina, which are individualised and not run into a common opening.

All the osseous structures at the base of the cranium in *Corcorax* and *Corvus* are very similar; though it may be observed that the prepalatines in the former are broader, and the postpalatines not so wide. The foramen magnum in the Crow is more circular; but such differences depart but slightly from those of a specific character, and are due to the shortness and greater breadth of the skull in *Corvus*. As we would naturally expect from what was said above, the mandible of *Corcorax* exhibits a greater curvature than it does in that part of the skull in our American *Corvidæ*. In *Quiscalus purpureus* we have the icterine type of skull with its modifications, as the peculiar flexing seen in the mandibles, and other characters, slightly departing from what we find in *Corcorax*, which renders a detailed comparison unnecessary. This likewise applies to *Megaquiscalus major*.

Passing to the Jays, and selecting the skull of *Garrulus glaudarius* for comparison, the differences to be noted are quite apparent; for in this species, as in some of the American forms, the mandibles are short, broad at the base, nearly straight, and with very large external narial apertures. The superior margins of the orbits are slightly raised, rough and thickened. Very broad and deep *pars planæ* are also present, while at the basal aspect of the skull of this Jay the prepalatines are narrow and very far apart. Hence, in so far as the skull indicates, the Jays hold a remoter relation to the subject of this sketch than the Crows of the genus *Corvus*.

[We may next compare this skull with that of a true Chough (*Pyrrhocorax pyrrhocorax*), and the similarity of the several characters at once points to the nearness of the relationships of the two birds. While the superior mandible in the Chough is curved, it is considerably longer than in *Corcorax*, though the narial apertures are the same both in size and outline. On the superior aspect of the skull of *Pyrrhocorax* the facial line of demarcation is pronounced, while just posterior to it the fronto-interorbital region is notably narrow.

At the basal aspect of these two skulls the characters are very similar. In the Chough the postero-external angles of the palatines are inclined to be rounded, while they are more pointed in *Corcorax*; and in this species, too, such other bones as the *pterygoids* and so on are relatively somewhat stouter. This does not apply, however, to the *zygoma*; for in both of these birds it is markedly slender.

Skeleton of the Trunk.—Osteologically, *Corcorax* presents in this part of its anatomy all the usual characters found among the *Passeres* generally; and, as I have so frequently described these

in former papers, it will not be necessary to touch upon them here, beyond making record of some special peculiarities pertaining to this particular species, and which do not occur in any of the other skeletons thus far referred to in the present article.

The *scapulae* are broader than those bones in the Chough, and more expanded distally. The outer side of either *coracoid* is produced outwards as a thin plate, and this is carried upwards to near the middle of the shaft. The *hypocledium* of the *os furculum* is a stumpy process, directed upwards and backwards; it is not half as large as we find it in *Quiscalus purpureus*. The number of the *cervical* and *dorsal vertebrae* agrees with the other species compared with it, and this is also true of the *thoracic* and *costal ribs*. A good distinctive character is seen in the *epipleural appendages*, for these are conspicuously large and long, while below they each are carried some little distance down on to the posterior margin of the rib to which it belongs, to be firmly ankylosed with it. These processes occur on the five dorsal ribs, but not on the pelvic pair.

The *sternum* possesses very large and broad costal processes, and a strongly bifurcated manubrium, which is extensively keeled inferiorly. The carinal angle is broadly rounded as compared with the Chough, where it is produced and pointed. One of the most striking characters of the sternum in *Corcorax* is to be seen at its xiphoidal extremity, where the "notch" upon either side is very small, and subcircular in outline. This causes the external xiphoidal processes to be correspondingly small, and not long and attenuated as in *Pyrrhocorax* and *Nucifraga*, and in the Jays and Grackles.

The sternal carina in *Garrulus* is comparatively very shallow, as compared with the other genera just mentioned.

Passing to the *pelvis*, there is at least one character that deserves our notice; it is presented on the part of the *ilia*, as seen on anterior dorsal view. Their mesial margins are much curved, causing them to curve well away from the *crista sterni* anteriorly and posteriorly, while for their middle thirds they come in contact with that process to ossify with it. This arrangement leaves the "ilio-neural canals" open anteriorly and posteriorly. Now this arrangement practically agrees with what we find in *Pyrrhocorax pyrrhocorax*, except that in this species the "neural canals" are closed posteriorly.

Now in the European Jay (*G. glandarius*) the *ilia* do not come in contact with the sacral neural crest at all; and we find there widely open neural canals, which is also the case in Clark's Nutcracker (*Nucifraga columbiana*), but not in the Grackles (*Quiscalus*) where it agrees with *Corcorax*.

The Chough possesses seven free *caudal vertebrae* and a large *pygostyle*, while *Corcorax* has but six, and the terminal bone or

coccyx. Jays usually have *six*, plus the *pygostyle*, which is true also of *Quiscalus*.

The Limbs.—Both the skeleton of the *pectoral* and *pelvic limbs* in *Corcorax melanorhamphus* present all the characters that we find to be present in those parts in any typical passerine bird, and especially one falling within the more or less true corvine series. These characters have been described upon numerous occasions in a number of my published papers on the osteology of passerine birds; so it will be unnecessary to restate them in this place, as those descriptions are readily accessible to avian osteologists. This also applies to the skeletology of the *pelvic limbs*. The osteological characters seen in the *pectoral limb* of *Corcorax melanorhamphus* are repeated in that part of the skeleton of *Pyrhcorax pyrrhcorax* and in the other species enumerated in the foregoing paragraphs of this brochure.

A real point of interest is to be found in the relative lengths of the *long bones* of the limbs of these several species, and such data is best set forth in a table wherein the metric system is used, thus:—

TABLE

Lengths of the bones in the pectoral and pelvis limbs
(In centimeters and fractions)

Species	Pectoral Limb					Pelvic Limb					
	Humerus	Radius	Ulna	Carpo-metacarpus	Index digit both joints	Femur	Tibio-tarsus	Fibula	Tarso-metatarsus	Mid anterior toe	Hind toe
<i>Corcorax melanorhamphus</i>	5.5	5.3	6.1	3.2	2.3	4.5	7.9	3.5	5.8	3.9	3.0
<i>Pyrhcorax pyrrhcorax</i>	5.3	6.0	6.5	3.7	3.0	4.1	7.5	4.5	5.0	3.7	2.2
<i>Garrulus glandarius</i>	4.2	4.5	5.1	2.2	1.7	3.7	6.2	3.6	4.4	3.3	2.3
<i>Nucifraga columbiana</i>	4.0	4.2	4.7	2.5	2.0	3.2	5.4	3.1	3.5	3.0	2.2
<i>Megaquiscalus major</i>	4.2	4.5	5.1	3.0	1.9	4.0	7.0	4.0	5.0	4.4	2.8
<i>Quiscalus purpureus</i>	3.5	3.5	4.0	2.3	1.8	3.4	5.4	2.0	3.9	3.1	2.1

Upon reviewing all the characters presented in the two skeletons, and these with others at hand, it would appear that the nearest ally that *Crocorax melanorhamphus* has among the forms thus compared is *Pyrrhocorax pyrrhocorax*—that is, the Chough.

In referring to the White-winged Chough in his excellent little work "An Australian Bird Book"—that is, to the species of which I have attempted above to give an account of its skeleton—Dr. J. A. Leach says, on page 186: "The White-winged Chough has no close relative in the world; possibly the Chough that nests in the cliffs of Cornwall is nearest to it." In this assumption Leach was quite correct; and while the two species are not very closely allied, comparative study of their osteology reveals the fact that the gap between them is by no means a very wide one, the relationship being about as close, I should say, as that between *Nucifraga columbiana* and such a species as *Cyanocephalus cyanocephalus*.

ON THE OSTEOLOGY OF *STRUTHIDEA CINEREA*.

Sharpe placed this bird, in his "Hand-List of Birds" (vol. v., p. 628), between the genera *Psilorhinus* and *Picathartes*—that is, in the family *Corvidæ*, among the Jays and Choughs.¹ Dr. Leach, in his "Australian Bird Book" (pp. 185, 186), also relegates this species to the *Corvidæ*, placing it between the Ravens and Choughs, and says of it (p. 186) that "the Apostle-Bird (Grey Jumper) and the White-winged Chough are two of Australia's 'anomalous birds.' Both go in flocks, so each has been called the 'Twelve Apostles.' However, the name has become attached to the Grey Jumper."

This surely is very extraordinary avian taxonomy; for a glance at a specimen of *Struthidea cinerea*, with its short, thickish beak; long, fanlike tail and grey plumage, together with hearing its notes, should satisfy almost anyone of the fact that the bird is surely not a corvine one of any description. It has nothing to do with the Jays, and still less with the Ravens, Crows and Choughs.

There are two skeletons of individuals of this species before me at the present writing, and, upon comparing them, some interesting points of individual variation are apparent. The second skeleton belongs in the collection of bird skeletons in the Division of Birds in the United States National Museum (No. 224,841); it was of a male that lived in the National Zoological Park, at Washington, where it died May 27, 1916. It was somewhat larger than the Melbourne specimen, which latter may have been a female (the sex on the label is marked (?)), and prob-

1. See also Sharpe, "Cat. Birds of Brit. Mus.", iii., p. 140, 1877. Mathews, "Handb. B. Austral.", p. 108, 1908, and Gould (p. 140).

ably was, as it bears no evidence of being a subadult individual (Plate ii).

The Skull.—There is a decided similarity in the cranial portion of the skull in a Chough, a Jay, a Grosbeak, and in *Struthidea*, and it is difficult to find any marked characters that in any way indicate a wide separation of such forms. To be sure, we find a little difference here and a little difference there; but they are all *passerine*, and so trivial that it is not an easy matter to define them.

Passing to the facial part of the cranium, however, we meet with a few characters that are more or less distinctive. The chief differences are to be detected in the morphology of the *mandibles*, the *palatines*, the *vomer*, and the *maxillo-palatines*. In *Garrulus* the superior mandible is nearly straight, and the narial openings are very large and occupy the posterior half of it. There is no osseous nasal septum. The *prepalatines* are narrow and widely separated, and the *maxillo-palatines* are bulbous and in contact with each other in the median line, resting upon the vomer, which is of nearly uniform width and projects slightly beyond them. These characters are so different from what we find in the corresponding parts in *Struthidea*, that it is quite safe to say that the latter is no Jay.

In *Struthidea cinerea* the form of the *superior mandible* is very much as we find it in some conirostral birds, being short, broad at the base, with sharp tomial edges, decurved, sharp at the apex; and when the bird is fully matured, the *small*, elliptical, narial aperture is situated at the middle point upon either side, with a dense and thickish internasal osseous septum between them. *Pyrhacorax* has a large, pear-shaped narial opening, with the larger end to the rear, and no osseous nasal septum. The mandible in this species or genus is long, decurved, and narrow, with the tomial margins not raised.

All this is entirely different from *Struthidea*; I may add, too, that in this Chough the post-palatines are short, and the pre-palatines long and narrow and well separated from each other, as in the Jays. The *vomer* is elongate and of uniform width, and the maxillo-palatines slender, each terminating mesially with an elliptical enlargement as in *Garrulus*. In short, in all this part of the skull *Pyrhacorax* and *Garrulus* are corvine birds, and *Struthidea* is not.

One is impressed with the fact that the superficial facies of the skull of the species here being considered is strikingly fringilline, and especially does this refer to the form of the mandibles, the cranium, and to several of the osseous structures at the *basis cranii*. This being the case, it becomes a matter of interest to compare the entire skull, including the mandible, of *Struthidea* with some conirostral bird most nearly approaching it osteologic-



Direct left lateral view of the entire skeleton of the Apostle-Bird (*Struthio camelus*) natural size.

Photo by Dr. R. W. Shufeldt, C.M.Z.S., Washington, D.C., U.S.A.

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ally. For this purpose, the skull of *Saltator atriceps* is selected; and it may be noted at the outstart that the *superior mandible* of this big Sparrow practically agrees in all particulars with the same part of the skull in the "Apostle Bird," with the exception that in the former species, the narial apertures, while they have the same outline, are situated more posteriorly. Seen from above, the forms of the two crania are quite similar, though in the Sparrow the *lacrymals* are somewhat more prominent, and the parietal region not quite so broad. On the ventral aspect the intertomial region is much the same, while in *Saltator* the prepalatines are far more slender than they are in *Struthidea*, and more widely separated. Moreover, the postero-external angles are spiculaform and produced, while in the Australian bird they are broad and truncate. The arrangement of the maxillo-palatines is much the same in the two species, and this applies to the form and articulation of the *vomer*. In both birds this latter element is produced forwards to fuse with the bony mass situated mesially in the posterior section of the rhinal chamber. So far as I have examined them, this never occurs among the Crows and Jays.

The *interorbital vacuity* in *Struthidea* is more extensive than we find it to be in *Saltator* and other Sparrows; but that is a character of but little weight, and even varies for individuals of the same species.

Turning to the *mandibles* of the two birds being compared, we find that they practically agree in all essential particulars, being in some respects quite identical in character. In *Saltator*, however, the articular surface between the processes posteriorly is not as extensive as it is in *Struthidea*; and to make up for this deficiency, we find there a small sesamoid bone, attached by ligament. Such a bone, and a comparatively larger one, is seen just behind either quadrate in the skeleton of *Paroaria cucullata*—a species with a skull having several points in it in agreement with the corresponding ones in *Struthidea*.

Passing to the *hyoid arches*, these bones are practically in agreement with what we find among average passerine birds the world over; so their description need not be touched upon here.

Vertebrae and Ribs.—Some minor points of difference may be found among the Crows, Jays, Cardinals, Finches, Sparrows, and others, as compared with the corresponding ones in *Struthidea*; but they are by no means striking or of especial taxonomic value. The table below will best show any variance these parts may present with respect to number, and number, in not a few instances, may point to a good deal along the lines of relationships and classification. A good example of this is seen in the constancy of the number of vertebrae in the cervical division of the spinal column in mammals.

TABLE

Species	Cervical vertebræ	Cervical ribs	Dorsal vertebræ	Thoracic ribs	Costal ribs	Pelvic ribs	Caudal vertebræ including pygostyle	Remarks
<i>Pyrrhocorax pyrrhocorax</i>	14	2	5	6	6	1	8	The six thoracic and costal ribs include the pelvic pair; last costals floating
<i>Garrulus glandarius</i>	14	2	5	6	6	1	7	ditto
<i>Nucifraga columbiana</i>	14	2	5	6	6	1	7	ditto
<i>Megaquiscalus major</i>	14	2	5	6	6	1	7	First pair cervical ribs; generally very rudimentary.
<i>Struthidea cinerea</i>	14	2	4	5 or 6	5 or 6	1	7	Pelvis ribs very rudimentary; epipleurals on second cervical ribs
<i>Saltator atriceps</i>	14	2	5	6	6	1	7	First pair of cervical ribs rudimentary.
<i>Paroaria cucullata</i>	14	2	5	6	6	1	7	Last pair costal ribs are floating.

It has been pointed out by me in several of my papers on the osteology of birds that the arrangement of the ribs may vary even in the same species. This is the case in the two skeletons of *Struthidea* now under examination for in the specimen from Melbourne there are *five* costal ribs articulating with the sternum, and only *four* in the case of the one in the collections of the U.S. National Museum—the additional pair connecting what has been considered above as the *second pair of cervical ribs*. Further, there is a slight difference in the size of these two skeletons, which may be due to sex. It is very slight, however, and far more evident in some parts than in others, being hardly more than a millimeter in length in the case of any particular bone.

From this it will be appreciated that the vertebræ and ribs of *Struthidea cinerea* offer but few characters of taxonomic value; and so we may pass to an examination of the *pelvis*. This bone, in its general facies, comes nearer to that part of the skeleton as we find it in the corvine types, as the Jays, Crows, Nutcrackers, Grackles, and so on, than to the pelvis of such species

as the Grosbeaks and *Saltator*. The corvine pelvis is well known and demands no description; while in such forms as *Paroaria cucullata* and *Saltator atriceps*—particularly in the former—the pelvis is short and broad; the mesial anterior borders stand far away from the rest of the sacrum, and their anterior extremities are obliquely truncate and not rounded as they are in *Struthidea* and the Choughs.

The Pectoral Arch.—Close comparison of these bones of the shoulder girdle soon reveals the fact that they are of the true passerine type in all respects but one, and that is, the *os furculum* practically possesses no *hypocleidium*; whereas in all such forms as have been referred to above, and in a host of other *Passeres*, the *hypocleidium* of the fourchette is a very conspicuous process. It is relatively much smaller, however, in the Choughs, Jays, and others, than it is in such a bird as *Megaquiscalus major* or in *Saltator atriceps* and their immediate allies.

The characters of the *coracoids* and *scapulæ* vary but little among any of these species. Both bones are distinctly passerine in type, and their variation, in the case of any two birds compared, is notably slight.

Apart from the fact of its being built along the lines of the passerine type, there appears to be but one character of importance in the *sternum* demanding attention; this character refers to the sternal *manubrium*. This process is anteriorly bifurcated in all typical passerine birds, with a substantial median base. Now in *Struthidea cinerea* this median part is more or less sessile, as we find it in the Jays and Choughs; while in such diverse forms as *Megaquiscalus*, *Saltator*, and certain Grosbeaks, the median portion is markedly produced.

The anterior border of the carina of the sternum of *Struthidea* is just as much concaved as it is among those birds wherein there is a big *hypocleidium* on the *os furculum*, and this concavity exists to make room for it in the articulated skeleton.

The Pectoral Limb.—Upon comparing the skeleton of the wing possessed by any of the several species of birds here enumerated, it will be observed that chief among the differences seen are in the form of the head of the humerus; the length of that bone as compared with the length of the bones of the antibrachium in the same wing, and some minor points of slight significance.

The remarkable fact in regard to the humerus of *Struthidea* is that it is about as long as the bones of the forearm, which is not the case in any other bird at hand. This humerus has a length of 3.5 cms., and the *ulna* of 3.7 cms., a difference of only two millimetres. In *Pyrhacorax pyrrhocorax* the humerus measures 5.0 cms., and the *ulna* 6.6 cms., and this difference, proportionately, is about maintained in the European Jay, Clark's Nutcracker, *Megaquiscalus*, *Saltator atriceps*, and others. *Struthidea* has a humerus in which some slight curvature is to

be seen in the shaft—barely sigmoidal, however; while upon the other hand a better marked curvature is observable in the humeri of the species enumerated above.

There are two styles presented in the morphology of the head of the bone, and it may be pneumatic or it may not. Taking *Megaquiscalus major* as the extreme of one type, we find the humerus in this species to be completely non-pneumatic; the shaft quite straight, and the extensive pseudo-pneumatic fossa divided off into two circumscribed concavities by an oblique, osseous partition. Of these, the one next the shaft extends far under the head of the bone, while the other occupies the entire ulnar tuberosity.

Bones of the *carpus* and *manus* in *Struthidea* present each and all of those characters we find in the corresponding parts in typical *Passeres* generally. And, as a matter of fact, the *humerus* appears to be the only bone in the pectoral limb—apart from the matter of comparative variations in lengths—that presents any points of interest. Here we find that the humerus of the European Jay (*G. glandarius*) agrees with that bone in the Chough in many, indeed in the majority of its characters, the principal point of difference being that in the Jay the rather large, single, and circular pneumatic foramen in the pneumatic fossa is more circumscribed and defined than it is in the Chough. In this matter the humerus of *Struthidea* agrees entirely with the bone in *Garrulus*—this, of course, apart from its size, it being considerably smaller.

Quiscalus purpureus possesses a humerus quite similar to what has been described above for *Megaquiscalus major*, with the exception that in the former species the osseous partition dividing the pneumatic fossa is aborted, and is only found as an oblique platelet confined almost entirely to the outer margin of the cavity, upon the rounded border of which its commencement appears as a conspicuous process.

Curiously enough, this style of humerus is repeated in such a species as *Saltator atriceps*, the difference being that in this latter bird the bone is pneumatic, and, as in certain Jays, much shorter than the ulna of the same limb.

The Pelvic Limb.—Pneumaticity does not seem to exist in any of the bones of the pelvic limb, in any of the birds thus far mentioned in this paper, and there are no very marked differences in the characters they present. In no one of them does the *femur* exhibit much curvature along its shaft. Superiorly, the head, the summit, and the great trochanter are all in the same plane, while the pit for the "ligamentum teres" occupies nearly the entire top of the caput femoris. Some compression of the shaft is to be noticed in the antero-posterior direction, while distally the condyles are large and well developed. A fairly good-sized *patella*, tridedral in form, is present in all of these

species, including *Struthidea*. This latter bird—the form here being described—has a femur measuring 3.3 cms. in length, while its *tibio-tarsus* measures 5.6 cms. and *tarso-metatarsus* 4.0 cms. Its fibula is extremely slender below the fibular ridge; and in the skeleton of this species in the U.S. National Museum collection (No. 224,841) is seen to be extended down the shaft of the *tibio-tarsus* almost to its distal end as an extremely fine, osseous thread. This apparently has been rubbed off by the preparateur in the case of the Melbourne specimen.

Distally, the fibula is long and thread-like in the Chough, and in some Jays, but not in the Purple Grackles.

In *Megaquiscalus major* there is a curved, elongo-triangular sesamoid surmounting the *tarso-metatarsus* at its inner side, which articulates with the posterior rim of the inner distal condyle of the *tibio-tarsus*, not present in the other species at hand; with respect to these, however, it may possibly have been lost.

This Apostle-bird has a *tarso-metatarsus* measuring in length about one-fourth less than the *tibio-tarsus*. Its shaft is perfectly straight, and tapers gradually to the commencement of the trochlear expansion at the distal end. Proximally, it presents a small, cuboidal *hypotarsus* that is twice-pierced, as in the Choughs, Jays, and others, for the passage of tendons, the larger foramen being the outer one. For its entire length the shaft is grooved posteriorly, the borders being sharp and cultrate. Anteriorly, the bone is similarly grooved for tendinal accommodation, but only the inner border is sharp. The outer aspect of this shaft is flat and broadish, and gradually tapers towards the toes. Purple Grackles, Jays, and *Pyrrhocorax* have the inner edge of this grooved shaft, posteriorly, much reduced, while the outer one is quite as much raised as in *Struthidea*.

As to the *podal digits*, they are, in number and character, much as we find them in the foot of the average passerine bird; they may vary somewhat in their comparative and average lengths; but they certainly do not offer any characters worthy of consideration with respect to their use in taxonomy (Plate ii.).

When we come to establish the position that *Struthidea cinerea* holds in the system, basing it upon all the data at hand at this writing, it must be admitted that it cannot be done with any degree of certainty whatever. This is almost entirely due to the fact that the necessary osteological and other anatomical material for the purpose of extensive comparison with all the birds that might be more or less nearly related to it, does not exist in the collections of the Division of Birds of the U.S. National Museum. As far as its osteology is concerned, it seems to point in several directions; but the material available does not admit of a sufficiently extensive comparison from which to draw definite conclusions. So, as it stands, the question is left, if anything, more doubtful than before. That the bird has a skull

presenting many important characters, agreeing or very nearly agreeing, with the corresponding ones in the skull of *Saltator atriceps*, and, doubtless, other large Sparrows, we must admit. But to offset this, Mr. Alexander Wetmore, of the U.S. Biological Survey, kindly counted the number of primaries in the wing of *Struthidea cinerea* for me, and he found that there are ten (10) of these. No true Sparrow possesses ten primaries, the number in them being invariably *nine*.

I believe it would be altogether premature to create a *family* at this time to contain *Struthidea*, although avian taxonomers may be compelled to do so later on, when more is known of the structure of the congeners of this puzzling type than is known at present. One thing is very certain, *Struthidea cinerea* has no very close affinity with the Jays, and far less with such corvine types as *Corcorax* and its allies. Morphologically, it should be compared with such species as *Glaucopis cinerea* and *wilsoni* of New Zealand, and with similar forms; but we have no anatomical material here to carry out such researches, whatever the future may have in store for us.

NOTES ON THE OSTEOLOGY OF *GRALLINA* *CYANOLEUCA*.

All that can be accomplished here in the case of this species, in so far as its osteology is concerned, is to make record of some of the more striking characters in its skeleton, as I have no proper material at hand wherewith to compare these characters; and in the absence of such it is quite hopeless to discover the forms most nearly related to it.

Apart from the configuration of the *external nares*, *Grallina* possesses an *upper mandible* to its skull closely resembling the same part in a number of species of average Thrushes. A narial opening, however, on either side, is an elongate ellipse occupying the posterior moiety of the osseous beak, the hinder two-thirds of which is sealed over by a thin plate of bone, leaving only a small, elliptical opening in front (Fig. 1, Pl. iii.). The culmen is rounded, and the whole mandible tapers gradually to a point, the *lower jaw* matching it beneath when duly articulated. In this latter bone the "splenial vacuity" is very small, and the posterior aspects of the articular ends are bluntly produced in the vertical plane on either side.

A *pars plana* is both thick and extensive, while superiorly it projects outwards in line with the "cranio-facial hinge," which latter is distinctly indicated by a fine, depressed groove of hair-like dimensions. The orbital margins are sharp, and the fronto-interorbital space above comparatively broad.

Grallina has rather small cranial capacity, and this part of the skull is rounded and smooth externally.

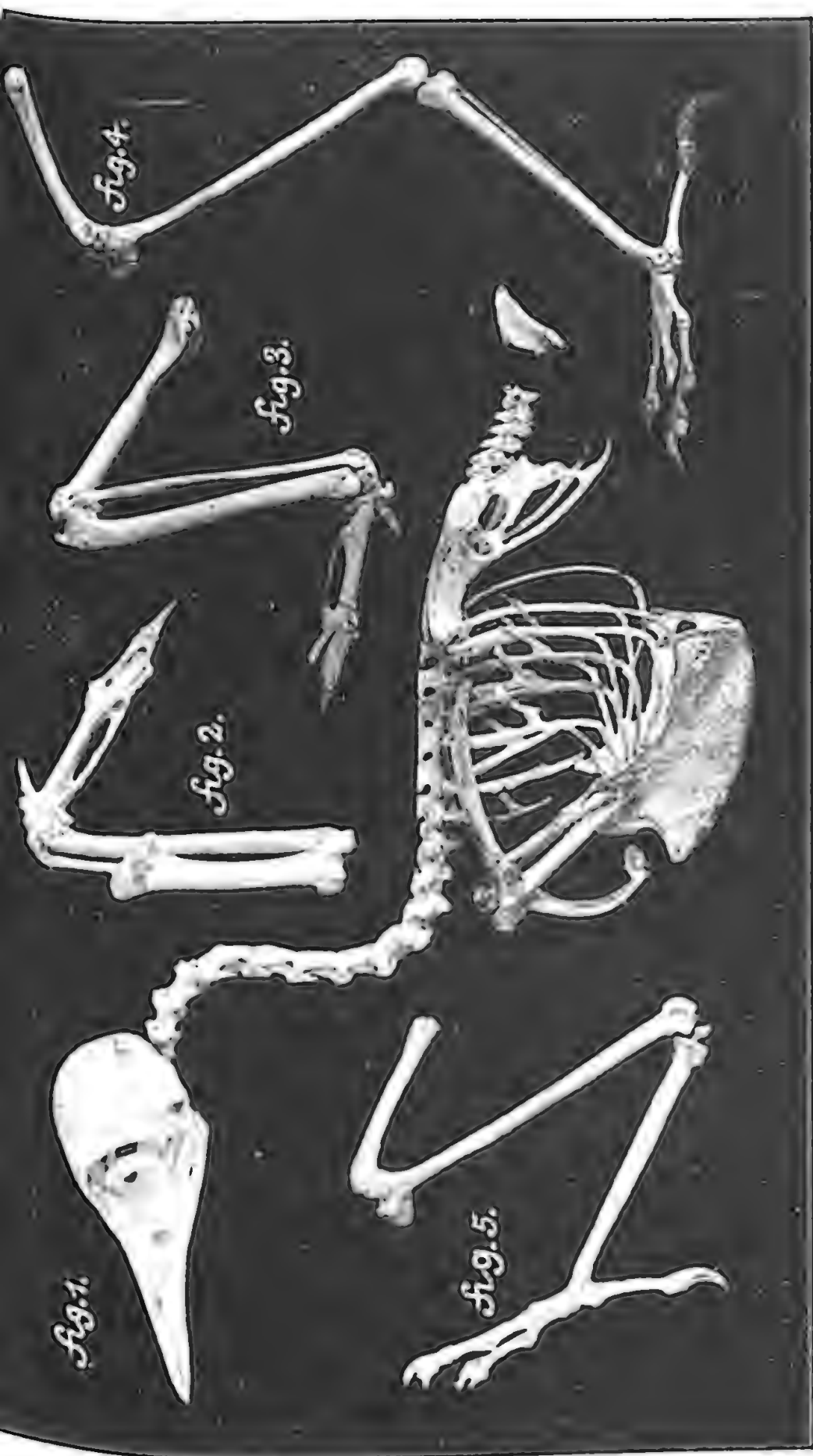


FIG. 1—Left lateral view of the skull and trunk of the Noddy-lark (*Gallinago cyanocephala*), natural size; orbital ring and mandible attached by wire; pygostyle detached. FIG. 2—Anterior aspect of left pectoral limb. FIG. 3—Anterior aspect of right pectoral limb. FIG. 4—Anterior aspect of right pelvic limb, flexed, with phalanges extended. FIG. 5—Outer aspect of left pelvic limb, flexed, with phalanges extended. All figures from photographs of the specimens.

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Either *orbit* is of good capacity, while the "interorbital septum" presents a large central vacuity, with a narrow one above, which latter is the continuation of the one found on the superior aspect of the anterior cranial wall. *Sclerotal plates* to either eye are small and narrow, and so thoroughly united as to appear to be coossified.

An ear-opening is markedly patulous, while above it may be seen the two usual processes directed downwards and forwards, they being of about equal length. Basally, there is to be noted the rather large, subcircular "foramen magnum," with an extremely minute *occipital condyle*.

Either *pterygoid bone* is compressed from above downwards and curved along its continuity; in articulation they do not meet beneath the sphenoidal rostrum. A *zygoma* is wonderfully slender and quite straight, but does not come in contact with the large *pars plana* of its own side as it passes beneath it to fuse with the premaxillary and nasal at some distance beyond it.

A *quadrate* presents no special peculiarities, its orbital process being compressed and somewhat dilated at its apex.

Either *palatine bone* presents a quadrilateral central part, the outer posterior angle of which is *rounded*, while its inner posterior angle is produced backwards as a rather long, slender projection, which, in the articulated skull, is in contact for its entire length with the same process of the fellow of the opposite side, with the sphenoidal rostrum above, and offers a facet to the corresponding pterygoid, posteriorly. Anteriorly the *prepalatines* are long, slender and far apart.

A rather broad *vomer*, transversely truncate anteriorly, fuses with the palatines posteriorly, being partially covered in the articulated cranium, upon either side, by the long, slender, backward-extending *maxillo-palatine*. The rhinal chamber is more or less filled in with dense, spongy bone, the osseous roof of the mouth being smooth and more or less entire.

In the *trunk skeleton* the *vertebræ* and *ribs* present nothing peculiar, beyond what one would find in any average passerine bird of this *size* and *type*, and very little need be said about the *pelvis*. The preacetabular portion of an *ilium* is uniformly concaved, rounded anteriorly, and curved for its entire length, the outer margin being sharp and concave, the inner correspondingly convex. These bones here stand well apart from the *sacral crista*, leaving, upon either hand, a wide open "ilio-neural canal."

A few minute intervertebral foramina are found in the postacetabular region, while either *os innominatum* fuses for its entire length with the sacral and other coossified *vertebræ* between them.

Laterally, there is a large, subelliptical *ischiadie foramen*, and a very much larger *obturator foramen*. The postpubic style is

long, slender and curved, and the "foot" of the ischium articulates with it for its entire extent below; while just above this articulation there is a very marked constriction of this lower ischiadic angle. (Fig 1, Pl. iii.).

Passing to the bones of the *shoulder girdle*, it may be noted that a *scapula* presents the usual passerine characters, it being curved for its entire length, concaved superiorly for its distal moiety, and obliquely truncated from within, outwards, for its posterior third, the blade terminating in a rather sharp apex.

Either *coracoid* is long and straight, with the shaft of uniform calibre, the sternal end being moderately expanded and limited; in articulation they appear to be in contact behind the manubrium of the sternum. *Os furculum* is of the U-shaped pattern, with a fair-sized hypocleidium, and with a very elongate, transversely flattened and narrow head upon either superior clavicular end. In articulation, this rests, flatwise, against the coracoid and scapula of the same side, forming a very perfect *foramen triosseum*.

In the *sternum* we find a manubrium of the usual form for the passerine type of the bone, it being large, markedly bifurcated above, and presenting a sharp antero-mesial border. Below it, this border is continuous with the sharp anterior border of the carina, which is here conspicuously concaved, terminating in a pointed carinal angle. This keel is convex for the entire length of its lower margin, and is continued to the end of the body of the bone. Distally, the entire xiphoid border lies in the transverse plane, and forms the arc of a semi-circle, the concavity being above. Either lateral xiphoid prolongation is short and broad; while in each case the mesial posterior angle touches the outer posterior angle of the midxiphoid prolongation, thus forming, one on either side, a not very large elliptical *foramen*. This is a very unusual formation in a *passerine bird*; for the sternum in this group has always heretofore been described as possessing a broad, triangular *notch* upon either side of the keel, such as we meet with in any average Finch or Thrush.

Coming to the *pectoral limb*, reference has already been made to the *humerus* (Plate iii., Figs. 2 and 3), and most of the other characters of this limb are well shown in the plate. One point in the hand, however, is well worthy of notice, and it occurs on the anconal side of this part of the skeleton of the wing. It may be distinctly seen in Figure 2, and consists of a very profound concavity in the proximal phalanx of the index digit, extending the entire length of the joint. Superiorly, this excavation terminates in a little pit, and there is a similar, though somewhat larger and deeper pit, in the sulcus found distally between the metacarpus of the index digit and that of the medius of the carpo-metacarpus, this part of the bone being distally produced, and supporting, at its termination, the last phalanx of the medius

digit, or the smallest one of manus. Both of these pits show in figure 2 of the plate.

In the *pelvic limb* all of the bones above those of the foot are *straight* and *slender*, and some of their characters have already been referred to in previous paragraphs of this paper. The *femur* has a length of 2.5 cms., the *tibio-tarsus* 5.2 cms., and the *tarso-metatarsus* 4.1 cms.

Judging from other passerine birds, there is reason to believe that *Grallina cyanoleuca* possesses *patellæ*; but they are absent in this skeleton, probably having been removed by the preparateur through an oversight, as very often happens when they are so small as they are in *Passeres* of the size of this species.

There is another species of *Grallina* in New Guinea, *G. bruijni*, the skeleton of which unfortunately is not at hand; nor have I that of *Hemipus picatus* of the Ceylon avifauna. Indeed, there are at least a score of birds in that part of the world that should be osteologically compared with the species here touched upon, before there would be any hope at all of correctly establishing relationships and affinities. Newton in the "Dictionary of Birds," stated the case thus: "Placed as it had been among Crows, Grackles, and Thrushes, Gould showed great discrimination (*Handb. B. Austral.*, i., 187) in not referring it to any group; but Sharpe (*Cat. B. Br. Mus.*, iii., p. 272) assigned it to *Prionopida*, even then a doubtful position and a doubtful Family; and Gadow has since ascertained that its vocal organs are not those of the normal *Oscines*." (Part ii., p. 380.)

We can now be well assured of one thing, and that is, *Grallina cyanoleuca* has practically no affinity with any of the Jays or Crows, or, indeed, with any of the small corvine birds; and osteologically, it is likewise a long way from a typical Thrush.

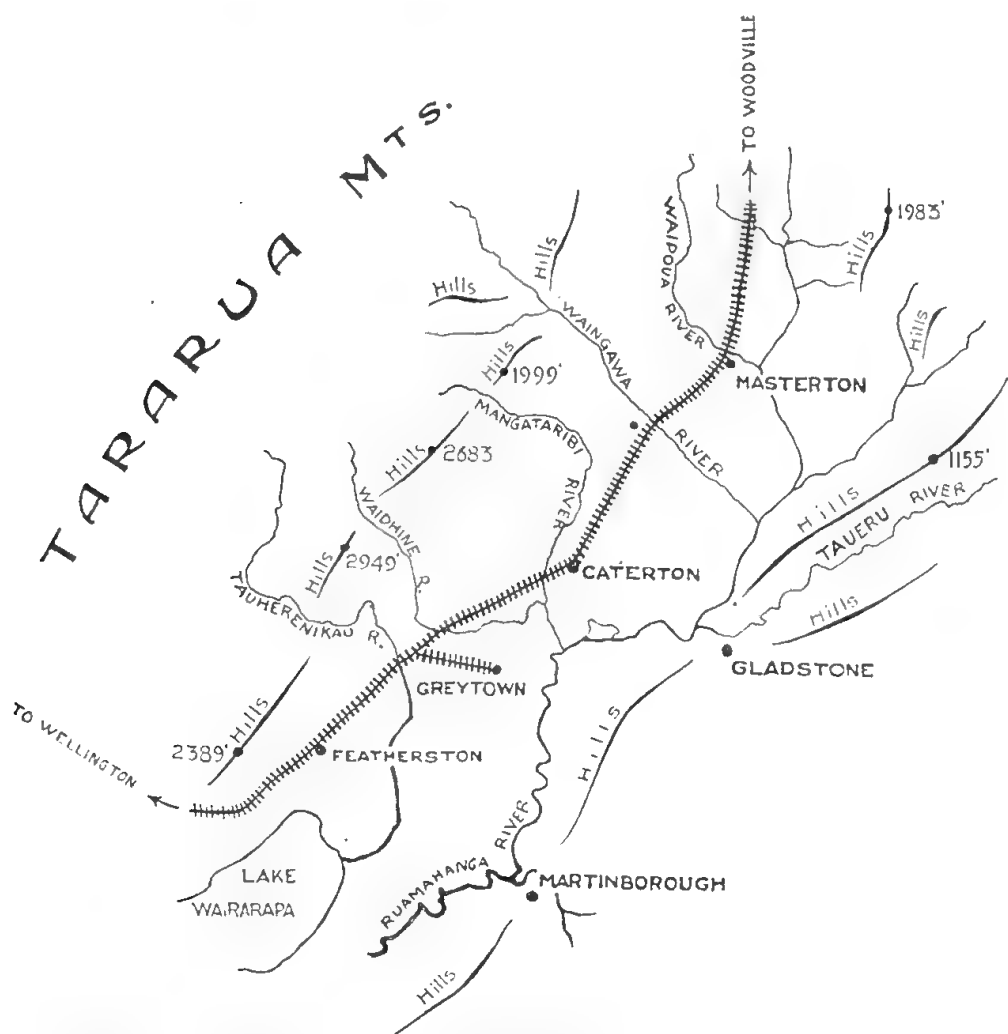
The Mangrove Bittern is a very common bird on the Brisbane River and Moreton Bay. We located a half-dozen nests in half an hour; the nests are built in the mangroves—just a platform of sticks on the fork of a tree, from 10 to 15 feet off the ground. I often wonder how the young birds manage to adjust themselves to such an uncomfortable home. The adult birds stand at the side of the little pools left by the tide, head bunched back into shoulders, body crouched low on legs, for an hour at a stretch, immovable. One might be mistaken for a stone, a rusty tin, or a piece of stick—until suddenly the head shoots out from the shoulders on a long, heron-like neck. Occasionally the birds get high and dive (one dived for a whole morning from the bumpkin of the boat); but they mostly content themselves with the wee fish in the pools.—LILA M. MAYO, R.A.O.U., South Brisbane.

Birds of the Wairarapa Plains

By R. H. D. STIDOLPH, R.A.O.U., Masterton, N.Z.

I.—INTRODUCTION.

This article deals with the bird-life of the country between Featherston and Masterton, a distance of about twenty miles, the plains being approximately eleven miles wide. Several rivers flow across the plains from the watershed of the Tararua Mountains, to join the principal drainer of the valley, the Ruamahunga. The plains are, naturally, practically level, except where they drop down in places to the Ruamahunga River, flowing as it does on the eastern side.



Sketch Map of Wairarapa Plains

The whole of the country is occupied by sheep and dairy farms, and as is the case with practically every settled portion of this country the indigenous forest no longer exists. In the place of

our beautiful native trees, grow exotic pines, willows, poplars, etc., and consequent upon the destruction of the bush, our forest-loving native birds have long disappeared. In their stead are aliens, for very few New Zealand birds are able to withstand the rapid changes that have taken place.

Of the few remnants of native bush remaining, all except one or two areas are spoilt. If cattle are allowed access to our forest, they break down the undergrowth and stop regeneration, destroy the spongy nature of the soil and introduce noxious weeds. And then wind finishes the destruction. That is what is occurring to most of our remaining patches of bush in the Wairarapa—in common with other parts of New Zealand. There are very few swamps in the district, and consequently, comparatively speaking, swamp birds are not plentiful.

For several very interesting notes I am indebted to Mr. A. S. Wilkinson, R.A.O.U., of Solway, and I wish here gratefully to acknowledge same.

II. THE BIRDS.

In the following notes R. denotes Resident; M., Migrant; S.V., Summer Visitor; W.V., Winter Visitor; O.V., Occasional Visitor; B., Breeds; V.P., Very Plentiful; P., Plentiful; S., Scarce; R., Rare; V.R., Very Rare. The nomenclature used below is mainly from Hutton and Drummond's "Animals of New Zealand."

Pseudogerygone igata. Grey Warbler. R.P.—This unobtrusive bird frequents every part of the country. In this district it is evenly distributed and its pleasing notes are to be heard all day, being at their best, however, in September and October. At Solway, Mr. Wilkinson found a nest containing young in the first week of October. It is fortunate for the warblers that the first brood is free from the victimisation of the Cuckoos.

Rhipidura flabellifera. Grey Fantail. R.P.—One of the most engaging of native birds. In April it is very much in evidence around houses, and on May 10th, 1921, one ventured in our pantry window, caught one or two house-flies and departed. The next morning it returned, but remained only for a few minutes. The following day, however, it was back again, and on this occasion stayed inside for an hour. While we had breakfast that morning we were entertained by this engaging little bird—we called it "Fanny." It was interesting to watch its movements. Nearly every house-fly in the kitchen was soon eaten, and in search of more, the bird visited every room in the house, six in all. It was noted that "Fanny" made a mistake several times in snapping at a nail head in the ceiling—surely its eyesight was not defective. Any dead flies picked from the walls were rejected as unfit for consumption. Having feasted, it perched upon a picture and preened its feathers and looked about it with an air of confidence. Its beady black eyes shone with the spirit

of joyousness, with the enjoyment of life. Next morning it again visited us, and had a meal of what few flies remained. It was noticed that "Fanny" paid its visits at practically the same time every morning—about ten minutes to eight. After July very few remain about dwellings, as domestic duties call them to a suitable nesting site, usually near a creek, where insects are plentiful. On the 31st August I found the first nest of this species this year (1922). It was just completed, and was placed in introduced broom about twenty inches from the end of a branch and twelve feet from the ground. The nest was not of the usual Fantail structure, as its distinctive apex was missing. It gave the following measurements:—Depth over all, 5 in.; diameter, $3\frac{3}{4}$ in.; of cup, 2 in.; and depth of cup, $1\frac{1}{2}$ in. It was composed mostly of rotten wood, especially at the foundation, dry leaves, dry grass and moss, bound together with horse hair, cow hair and cobwebs—the usual materials used in Fantail land. The inside and lips of the cup was mostly finished off with hair. Further observation of this nest was prevented as school-boys discovered it, and in order to reach it cut the branch on which it was placed. Another pair of these birds attempted to raise a brood in the Public Park about the same time, but the four eggs and nest were destroyed, again by school-boys. On 23rd September, however, I found another nest; this time safe from interference. It was placed $5\frac{1}{2}$ feet from the ground, was 4 in. in depth, $3\frac{1}{2}$ in. in diameter, and the cup measured 2 in. across and 1 in. deep. It was built of the usual materials, but was woven into several branches of the shrub in which it was placed. It contained one egg, pinkish white in colour, with spots, mostly at the thick end, of very light brown and a few of a darker shade of brown. On 30th September two more similarly coloured eggs had been added, and on the 14th of October three newly hatched young occupied the nest, and on my approach on the 23rd October the young birds flew out of the nest. On this occasion the adult birds fluttered within three or four inches of my face (as if attacking me), and one settled on my head several times. I have not seen the Black Fantail (*Rhipidura fuliginosa*) here.

Anthus nova-zealandia. New Zealand Pipit. R.P.—One of the few native birds that increased settlement of the country has benefited. Occasionally I see one in the garden, but it favours the river beds. It, like the Fantail, has an engaging disposition. It delights in human company. Often have I watched them feed unconcernedly within a few feet of me, run along a short distance, stop, give a little jerk of the tail, utter a "zee," look about, spy an insect, pursue it and catch it. Sometimes it carries its victim in its mandibles for a few moments as if contemplating the delicacy of the morsel. On the 10th September last I flushed a bird from its nest on the river bed of the Ruamahunga. It was placed on high ground on the sand, but at the foot of stunted broom which the prevailing winds had blown over to an angle

of 45 deg. It was, perhaps, as cosy as any nest could be, was composed of dry grass, and was $2\frac{1}{2}$ in. across the cup and $2\frac{1}{4}$ in. deep. It contained three eggs, dirty white in colour, marked thickly all over with light brown, with a few underlying marks of mauve. On the 23rd September two young birds were found in the nest, the remaining egg was lying nearby and contained a dead chick. Further observation of this nest was prevented owing to the flooded state of the river.

Zosterops lateralis. Silvereye. R.P.—Towards the end of March this bird is much in evidence, for it is then that it flocks, sometimes in very large numbers, and it is then that it flits from tree to tree uttering its lively call note. This year (1922) it seemed scarcer than usual, for very few pairs remained to breed. Last winter several instances were recorded of what was believed to be this bird, migrating at night.

Prosthemadera novæ-zealandiæ. 'Tui. R.R.—A few pairs linger in this district, formerly they were present in their thousands. It is believed, however, they have slightly increased in numbers lately. In November, 1921, Mr. Wilkinson discovered a nest in an introduced pine (*Pinus insignis*). Three eggs were laid, but were destroyed. It seemed strange that this bird selected that species of tree in preference to a native, of which there are several acres in close proximity.

Halcyon vagans. New Zealand Kingfisher. R.R.—It is a pity this beautiful bird is so rare here. You may see one on a day's journey or you may see none. I am afraid it is often shot; its gaudy plumage makes it an attractive drawing-room acquisition.

Lamprococcyx lucidus. Shining Cuckoo. S.V. S.—First noted this year (1922) on the 14th October. Is to be found in most parts of the district all through the summer months.

Circus gouldi. Harrier. R.P.—These birds always are to be found, but are most plentiful during the autumn and winter months. They have few friends and thousands are shot every year. A price is placed on their heads by Acclimatisation Societies, as they contend these birds are destructive to game-birds. It is deplorable that they are so ruthlessly destroyed, as these fine birds are probably useful on the whole.

Nesierax australis. Bush-hawk. O.V., R.—A visitor only to the district, being seen usually in the winter months. I have no record of its breeding here. In Hutton and Drummond's "Animals of New Zealand," two species of *Nesierax* are given, the Quail-hawk (*N. novæ-zealandiæ*) and Bush-hawk (*N. australis*). In that book it is stated that the Quail-hawk does not occur in the North Island. Consequently I have placed the birds I have noted under *N. australis*. It is very hard to distinguish these two species on the wing. In any case, it is an open question whether there are two or only one species of *Nesierax* in

New Zealand. It is a mistake, I think, to create a new species of hawk because of its slightly smaller size, knowing that these birds are so variable.

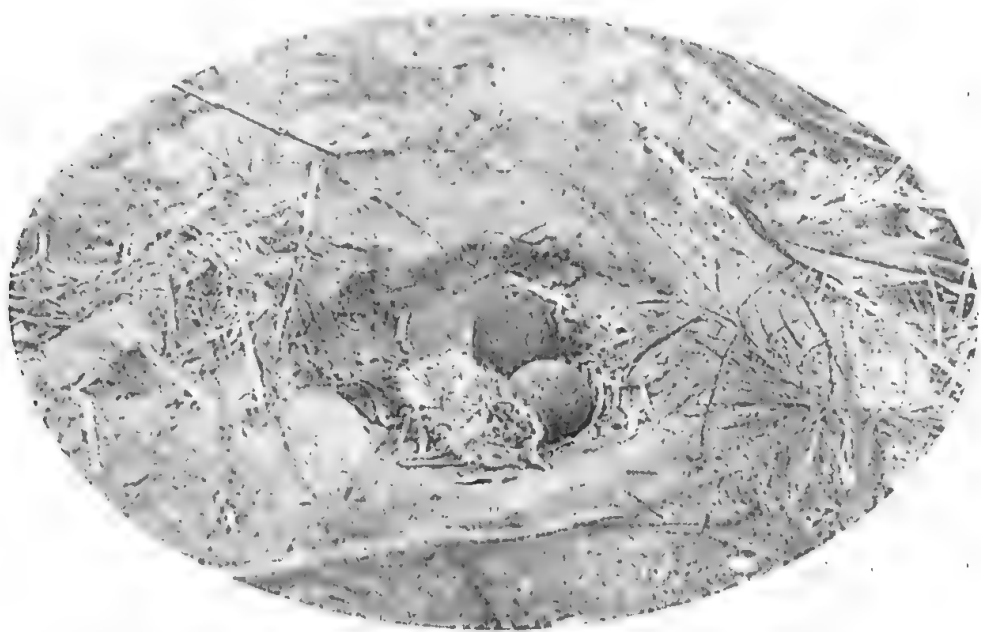
Ninox novæ-zealandiæ. Morepork (Boobook Owl). R.S.—Equally distributed throughout the country-side, its familiar cry from whence it takes its name, being heard almost any night. During the last week of October, I visited a small piece of bush not far from my house. A morepork flew away on my approach, but a vigilant fantail spied the outlaw and followed, soon to be joined by two Grey Warblers, several Silvereyes, and a pair of Hedge-Sparrows. These small fry kept up an incessant chatter, much to the discomfort of the owl. I endeavoured to snare it, in order to photograph the bird, but it was too wide awake, as it flew away when I approached too close. Last year a pair nested in this bush and reared two young.

Porzana affinis. Marsh Rail. R.S.—Two of these birds were noted on a swamp at Waingawa. The birds seen were very tame. They took no notice of my brother, whom they allowed to approach within a yard or two. They preened their feathers. When their toilet was completed they searched among the rushes for food, and ran with agility on the dead raupo leaves floating on the surface of the water. At intervals they puffed out their feathers. When another bird, probably a member of the same species, called, with a sound resembling that produced by an inward-drawn kiss or smack of the lips, the two engaging little rails disappeared. These birds probably are more numerous than is supposed, as in their haunts they are very rarely seen. I have no record of the Swamp Rail (*Porzana tabuensis*) in this district, but almost without doubt it is present. It is found around Lake Wairarapa, at the southern end of the Wairarapa Valley. Another swamp bird, the Pectoral Rail (*Hypotaenidia philippensis*), practically without doubt is resident in the district, but I have not seen it. In the local school museum there is a specimen of this bird, together with two eggs, "supposed" to have been taken locally. Nobody knows of its history, however. This bird has been reported to me, but unless the authority is authentic I disregard it.

Porphyrio melanonotus. Swamp Hen. R.P.—On the few swamps of the district this bird is to be seen, and appears to be holding its own. Occasionally to be found along the river banks in suitable localities.

Botaurus poeciloptilus. Bittern. O.V., R.—To my knowledge a visitor only, but it is quite possible that it may breed in the district. In 1921 a pair visited the swamp at Waingawa in the second week of June, but did not remain long. In 1922 one was observed on the 20th January, and again on the 1st October. After the last date the birds were noted on several occasions, and had not left on the 3rd December.

Charadrius bicinctus. Banded Dotterel. S.V., P.B.—These birds are plentiful on and near the river-beds during the breeding season. The last record of this bird in 1922 was the 15th February, when I saw a flock of six or seven on the Ruamahunga River-bed, but according to reports received by me from a resident of Waingawa, these birds had left that locality about two weeks previously. The first note I have of their reappearance was in the third week of July. Although dozens nest on comparatively small areas of the river-beds, it is very difficult to find their nests. Mr. Wilkinson, however, found three nests on the 23rd September, 1922. The first was placed in driftwood on the Waingawa River-bed, and contained three eggs. The nest was examined again the next day, when two of the eggs had hatched; on the 25th the remaining egg had hatched, and on the 26th the chicks had left the nest. The other two nests were placed among stones, one (deserted) contained two eggs, and the other, three chicks. On 8th October, by hiding in some broom, I discovered another nest of this bird. In this case, it was placed merely in a depression (4½ in. across) in the sand,



Nest of the Double-banded Dotterel; the back egg has just been chipped and young one has emerged,

Photo. by R. H. D. Stidolph, R.A.O.U.

and on inspection I found one chick and two eggs, one of which was chipped. The eggs were of the usual dotterel shape, but one had a decidedly brighter colour, being a yellowish grey instead of a greenish grey, as was the other. The chick had rather large legs and feet, of a grey color, and remained absolutely motionless during inspection. These birds are very alert during the breeding season. They run along the river-beds, stopping

every yard or two, to utter their "pwit"-like note, with a characteristic toss of the head. During 1921 I observed a bird with one leg; perhaps it had suffered from the same disease to which the pipit is subject, apparently a shrivelling up of the foot.

Himantopus leucocephalus. White-headed Stilt. S.V., S.B.—Absent during the winter months, these birds arrive in the district about September, and nest on the river-beds. I have not been able to find out the exact time of this bird's departure from the district, but believe it is about January. One pair I observed on the Waingawa River-bed attacked an immature Black-backed Gull on its approach. They flew to about 10 feet above the gull, and then swooped down, and compelled it to take hasty flight. I have no record of the Black Stilt (*Himantopus melas*) in this district.

Larus dominicanus. Black-backed Gull. W.V., P.—These birds arrive usually about the first week in February and leave about the second week of September. They congregate in large numbers at Waingawa, the freezing works there being the attraction. Elsewhere, they frequent newly ploughed fields. An odd immature bird may be observed during the summer months.

Phalacrocorax carbo. Black Shag (Cormorant). R.S.—A much-persecuted bird, but in spite of all attempts at its destruction it survives still. There are, I believe, one or two shaggeries in the district. Have no record of any other species of shag in this district.

Anas superciliosa. Grey Duck. R.P.—Not very plentiful in this district, owing to lack of very suitable shelter in the way of lakes, swamps, etc. Where it does occur, it is, unfortunately, shot at all times of the year. I have no record of any other species of duck locally.

INTRODUCED BIRDS.

Everywhere introduced birds abound. On a trip to Gladstone, a distance of about eight miles, I counted 275 introduced birds, and two native birds. That will give the reader an idea of the proportion of native species to introduced species in open country. The following aliens have been noted:—Skylark, Song Thrush, Blackbird, Hedge Sparrow, Goldfinch, Greenfinch, Chaffinch, Yellow Hammer, Starling, all plentiful; House Sparrow, exceedingly plentiful; Redpoll, Indian Myna, Rock Dove, Californian Quail, White-backed Magpie, scarce; Black Swan, rare visitor; Pheasant, very rare, and Pea Fowl (*Pavo cristatus*) completes the list. The last-named is found only near Gladstone, where it is protected by the owners of the properties on which it is found. A white Blackbird—that contradiction in terms—was caught on the Waingawa River a short time ago, and an almost pure white Sparrow at present inhabits Colombo Road,

Masterton, the wings only having a few slight brown feathers. I have two records where, presumably, the Skylark has removed eggs from its nest after they had been inspected. Last year I found two nests of this bird and in both cases I photographed them, but was careful not to touch the eggs, and to rearrange the surroundings as I had found them. However, when I next inspected them, one a week later, the other three days later, I found the nests empty. There were no broken shells about to indicate destruction by vermin, and it was unlikely that the nests had been discovered by school children. Presumably the birds had removed the eggs.

III.—CONCLUSION.

Such is the bird-life of the district to-day, very very different from what it was eighty years ago. Then the woods covering these plains were full of native birds—the cooing of the Pigeons, the chatter of the Parrakeets, the k-rr-k-rr of the Kaka, the clink, clonk of the Bell-bird, the notes of the Huia, and many other species, echoed from everywhere. To-day the small boy in search of eggs will gather those of the Song-Thrush, Black-bird, Sparrow and the various finches introduced by man.

But will the present bird population remain the same? Will any native species resuscitate itself? I hardly think so. Probably the four species of native bush birds left will linger on, and the others mentioned in the list will continue to be inhabitants of the district. But among introduced birds there will be changes. The Indian Myna is in a precarious position, its numbers are gradually diminishing. The Pheasant would probably disappear if it were not for the fact that numbers are continually being released by the Acclimatization Society. Pea-Fowl would soon be extinct if the protection afforded them was removed. The others will probably remain for all time. We can expect, however, new species to introduce themselves, notably the Cirl Bunting, Mallard, Little Owl, and Rook, all of which are found in other parts of the North Island. Some new species may be introduced by man, and perhaps some Australian birds will colonise themselves, as did the Silvereye. But our native birds—

“Gone are the forest birds, arboreal things,
Eaters of honey, honey-sweet of song,
The Tui, and the Bell-Bird—he who sings
That brief, rich music we would fain prolong.
Gone the Wood-Pigeon’s sudden whirr of wings;
The daring Robin, all unused to wrong;
Wild, harmless, hamadryad creatures, they
Lived with their trees, and died, and passed away.”

—From the Hon. W. P. Reeves’ poem “The Passing of our Forest.”

Synopsis of Species of Thornbills

By A. G. CAMPBELL, J.P., R.A.O.U., Croydon (Vic.).

In "List of the Birds of Australia," G. Mathews, 1913, there are shown 3 genera and 13 species, comprising in all 38 sub-species of the family Acanthiza. Additions since that date, including those in "Birds of Australia," Mathews, vol. ix., 1922, bring the total to 4 genera and 13 species, totalling 86 sub-species.

I submit 2 genera and 17 species with 43 sub-species, and consider this to be a practical classification based on the evidence of a very large series of skins.*

* * *

Genus ACANTHIZA. Vigors and Horsfield.—Colour of upper tail coverts ochre brown, subterminal dark band on tail not more than half an inch wide; throat flecked or striated; first primary less than half length of second.

A. lineata. Gould. Striated Thornbill.—Crown umber-brown with white shaft streaks.

A. nana. Vigors and Horsfield. Little Thornbill.—Forehead plain; no bright rump; back olive citrine; throat buffy; abdomen yellow.

A. inornata. Gould. Western Thornbill.—Upper surface olive; no bright rump; no white tips to tail; under surface creamy.

A. ewingi. Gould. Tasmanian Thornbill.—Forehead uniform tawny; wing with five primaries edged tawny, a conspicuous patch; throat grey with indistinct flecking.

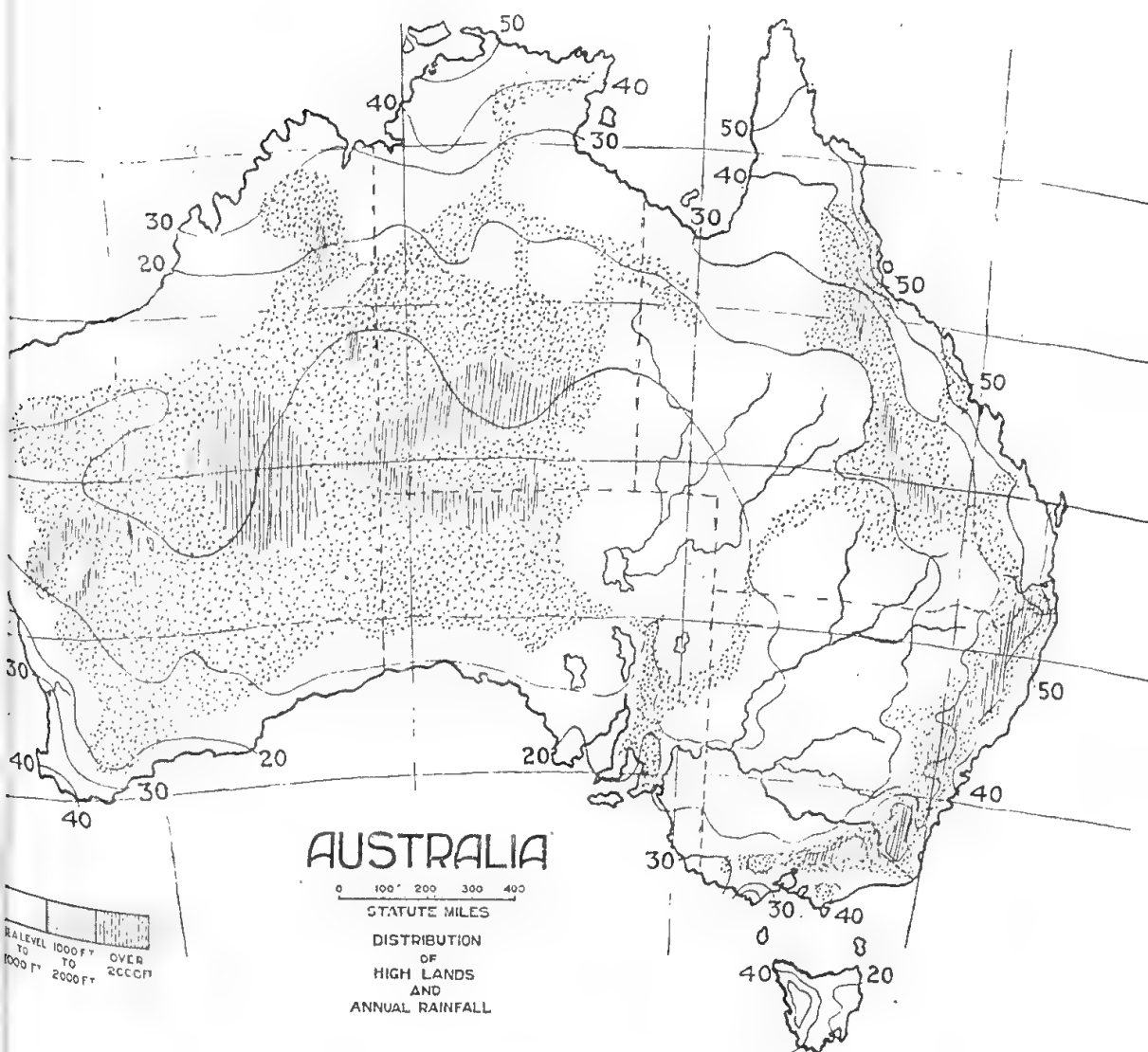
A. katherina. De Vis. Mountain Thornbill.—Forehead crescents indistinct; throat indistinctly flecked; flanks extensively coloured dark citrine; tail bar .4 inch wide on third feather.

A. pusilla. John White. Brown Thornbill.—Upper surface olive to dark brownish olive; tail bar .3 inch wide on third feather reduced to an oval or round spot on central feathers; forehead crescents more sharply defined in southern and insular forms; crescents obscure forehead plain tawny in northern forms.

A. apicalis. Gould. Broad-tailed Thornbill.—Back of head grey; back tinged dark citrine; tail bar .4 inch wide on third feather, with obscure dark band on centre feathers, much white on tips.

*These include collections of Edwin Ashby, Adelaide, numbered 1 to 94, of S. A. White, Adelaide, and of T. P. Austin, Cobbora, N.S.W., 400 to 420; the collection of the late A. W. Milligan numbered 95 to 120, the R.A.O.U. Collection; the National Museum Collection numbered 300 to 350, and chiefly the H. L. White Collection numbered 2074 to 2257.

I wish to express my best thanks to the owners of these bird skins, and especially to the Trustees of the National Museum, Melbourne, the Australian Museum, Sydney; the South Australian Museum, the Queensland Museum, the Hobart Museum, and the West Australian Museum, who all supplied valuable material for examination, in some notable instances types of species and subspecies.



EXPLANATION OF MAP

Map, adapted from Federal Handbook, 1914, showing how *Acanthizae* could be distributed, assuming that the original stock came via Queensland. Hatched and dotted portions are also the geologically older land surfaces, which still show unbroken connections with Victoria and South Australia. The chief break was the large rift-valley running north through Spencer Gulf. White portions are in the main younger and newer land surfaces on which the greatest variations occur. The vast interior regions inside the 10 inch isohyet have developed pallid desert races, while many other species of birds have there passed out of existence.

A. whitlocki. North. Western Red-tailed Thornbill.—Upper surface olive grey with buffy brown on back, crescents whitish; wing and tail long; tail bar .5 inch wide; much white on tips; under surface mostly white.

A. pyrrhopygia. Gould. Red-tailed Thornbill.—Upper surface olive brown, head not lighter than back, crescents very distinct buffy with sharply defined black spot at base; upper tail coverts bright argus brown; tail bar .5 inch wide on third feather; dark band on centre feathers, much white on tips. Pallid races lose the brown on head and back; upper tail coverts become dull snuff brown and under-surface lighter.

A. albiventris. North. Allied Thornbill.—Upper tail coverts brightest hazel; tail bar .6 inch wide; inner web of tail feathers drab, becoming lighter towards base or tinged with tawny.

* * *

Genus GEOBASILEUS. Cabanis.—Colour of upper tail coverts yellow to tawny; basal portion of tail light or brightly coloured; throat plain or with faint dusky fringes; first primary more than half length of second.

G. uropygialis. Gould. Chestnut-tailed Thornbill.—Base of tail tawny like upper coverts; pallid races have the under surface nearly all white.

G. robustirostris. Milligan. Thick-billed Thornbill.—Upper surface grey, crown streaked black; base of tail cinnamon like upper coverts.

G. tenuirostris. Zietz. Small-billed Thornbill.—Black greyish olive; crescents large; upper tail coverts cream; base of tail faintly light coloured; tips white; undersurface cream.

G. hedleyi. Mathews. Dark Thornbill.—Back dark brownish olive; crescents small; upper tail coverts cream; base of tail faintly light coloured, outer feathers tipped white; under surface dark buffy olive.

G. reguloides. Vigors and Horsfield. Buff-tailed Thornbill.—Back brownish olive, upper tail coverts mostly buff, base of tail buff; abdomen cream buff.

G. squamatus. De Vis. Varied-tailed Thornbill.—Back yellowish olive; upper tail coverts yellow; base of tail buff; face whitish, abdomen yellow.

G. chrysorrhous. Quoy and Gaimard. Yellow-tailed Thornbill.—Forehead black spotted with white; upper tail coverts yellow; base of tail whitish.

Nest of the White-eared Fly-catcher

By LILA M. MAYO, R.A.O.U., Roseberry Street, South
Brisbane.

The nest of the White-eared Flycatcher is, so far as I am able to discover, the first of that bird to be placed on record; the nest is now in the Queensland Museum and has, I believe, been registered. In working through scrub on Stradbroke Is., Moreton



Nest of White-eared Flycatcher (*Monarcha leucotis*)

Photo by Mrs. L. M. Mayo, R.A.O.U., South Brisbane

NATIONAL MUSEUM MELBOURNE

Bay, Miss Geissmann and myself found a bird, black and white, new to us. Miss Geissmann thought it some kind of Flycatcher, and we observed it for some time. It whistled constantly, two staccato notes and one very long drawn out and plaintive; the birds also had little conversational notes with each other. Miss Geissmann saw nesting material in one bird's beak. We searched but failed to locate nest. On returning to the boat I looked up Hall's *Key*, and identified the bird as the White-eared Flycatcher (*Monarcha leucotis*).

Next morning we started out again, Miss Geissmann with camera, myself with "Hall" and field glasses, and found the birds in the same patch of scrub. They were feeding low, and came readily to their own whistle call, alighting on leaves of shrubs rather than the twigs. Miss Geissmann eventually found the nest, and for some while we watched the birds at work. Both birds worked, and shaped the nest with their breasts. Miss Geissmann fixed her camera in tree and pictured the nest; yet, although we waited patiently, the birds would not visit the nest while the camera was in position, but flew about in the scrub, whistling constantly. Next day we had to start back to Brisbane, but we left the nest untouched, content with the photograph. On reaching Brisbane we visited the Museum to make quite sure of our birds. A fortnight later we decided to return to Stradbroke Is. to see if the bird had laid and the eggs hatched out. We found the nest easily, but it was deserted, so we took possession of it, and brought it up to the Museum.

Dimensions of nest as supplied by courtesy of the Museum authorities:—Diam., 3in.; depth, 3½in.; inner diam., 2in.; inside depth, 1½in. Nest composed of thin strips of teatree bark, with green moss woven into and over teatree; outside covering of cobweb-like aphis; inner lining fine hairlike roots of fern, blackish in colour. The nest was built on a sloping fork of limb at a height of from 10 to 12 feet above the ground.

Description of first nest to be recorded of White-eared Flycatcher (*M. leucotis*) (Gould), found on Stradbroke Is. by Miss Geissmann (in company with Mrs. Mayo).—Next built on a sloping forked limb 10 to 12 feet from ground—the tree slight, with rounded leaves (*Acronychia laevis*). The nest formed of thin strips of teatree bark with green moss woven among and over the teatree; largely covered outside with a cobweb-like plant or aphis; interspersed with a white hairlike filament (not identified); inside lining of nest black hair-like roots of fern. The nest was built quite close to a path, and could be plainly seen from the path. The birds kept low nearly all the time they were under observation.

The Coastal Habitat of the Striped Honeyeater (*Plectorhyncha lanceolata*)

By J. F. H. GOGERLEY, R.A.O.U., "Ellerslie," Wallis Lakes, N.S.W.

While looking at some collections of eggs at Forster, I saw clutches of eggs which the boys said were the eggs of a bird they called the Summer Bird. Not being able to place the species, I showed the eggs to Mr. J. H. Bettington, of "Terragong," Merriwa, but he was also unable to give them a name. We were all puzzled about the bird until this spring, when Mr. S. W. Jackson, R.A.O.U., was on a visit to Ellerslie. I showed him the eggs, and he said they were the eggs of the Striped or Lanceolated Honeyeater, though the eggs were more heavily coloured than those of the inland bird in its proper habitat. How he was able to place the bird was owing to the fact of seeing these birds at Iluka, at the mouth of the Clarence River, twenty years ago, which speaks well for the memory of Mr. Jackson.

Mr. Jackson says that Iluka and Forster were the only places that he had ever seen these birds on the coast, while on his travels, which extend over a wide area of Australia.

It is a remarkable fact for this bird to leave its proper habitat, so far inland, to come to the coast in two places, *i.e.*, Iluka and Forster, which are a good distance one from the other.

The bird has evidently been driven to the coast in these isolated instances by drought, and finding food and conditions to suit, it has made its home in these small areas. The most remarkable fact is that the bird only frequents a small part of the district, the extent of its habitat being bounded by Cape Hawke on the south, and the Manning River on the north, an area which would be about twenty miles long by eight miles wide. The birds are more numerous about Forster, but are very thinly distributed over the other parts of the district.

Mr. Jackson described the nest as being made of wool and Emu feathers on the Mooney River, where he saw the bird in its proper habitat. The nest of the Forster bird is built of very fine grass and rootlets, woven together with spiders' webs and native cotton. It is always placed on the drooping branches of the paper-bark trees, making it a very hard nest to get.

The photograph of the nest with this article was kindly lent by Mr. Jackson, who is noted for his wonderful work in ornithological photography. I am also indebted to Mr. Jackson for his note as to this bird being at Iluka.

Doubtless, as the coastal conditions have made such a change in the markings of the eggs, there will most likely be a slight change in the plumage, and I intend to secure a skin to see if there is any marked difference or not.



Nest of the Striped Honeyeater (*Plectorhyncha lanceolata*).

Photo. by Sid. W. Jackson, R.A.O.U.

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Both Mr. Bettington and Mr. Jackson say that the differences in the markings of the eggs are very strong. Personally, the inland bird is unknown to me.

The fact of the bird being called the Summer Bird around Forster is owing, no doubt, to its being noticed only during the breeding season when the local boys are collecting eggs.

The strangest point about the bird's local habitat is the line of demarcation on the south. Draw a line from the Cape Hawke Mountain to the lake, and there are no birds to be seen on the southern side of the line or on Cape Hawke itself. There is none of these Honeyeaters on Wallis Island, although this is the same class of country as that around Forster, where the *Plectorhyncha* makes its home. It would be very interesting to discover what makes these birds keep to this small area. It is the food, no doubt, but what kind of food, when apparently all the country for ten miles round has just the same trees and flowers. It remains to be seen if the plumage of the bird has changed as much as the egg-markings.

In that fine article by Capt. S. A. White, on his last trip across Australia,* he mentions seeing *Plectorhyncha lanceolata* between Longreach and Bourke. This line of country is a long way from the coast of New South Wales, and how the few birds came here and bred up the small colony is a mystery.

This visit of the R.A.O.U. and the fine lecture by Captain S. A. White on Bird Economies during the Camp-out at "Ellerslie," in 1921, are having very marked effects in stopping egg-destruction and helping to preserve the birds of the district. The visit of the R.A.O.U. aroused an interest in bird life that will set the young people on the right road to the study of ornithology, and teach them to know their birds.

Young of the Gibber-Bird.—As the young of the Gibber Bird (*Ashbyia lovensis*) differ considerably from adult birds, a short description seems advisable, as I cannot find a record of such.

The young birds differ from the adults in that the upper surface has a more rufous-cinnamon wash to the feathers; there is also a distinct wash of rufous-cinnamon colour on the breast and throat of the young. This wash gradually recedes upwards, until at adult stage the breast, throat and abdomen are a deep lemon yellow, which becomes much brighter during the mating season. The bill of the young is a light brown or horn color; it is black in the adult; the feet are light brown, brown in adult; the legs are light horn colour, almost black in adult; the iris is of a lemon or light straw colour, which is similar to the iris of the adult. The above description of the young bird is taken from specimens that have recently left the nest and are able to fly well.—J. NEIL MCGILP, R.A.O.U., King's Park, S.A.

* "The Emu," vol. xxii., p. 234.

Some Notes on Young Penguins (Genus *Eudyptes*)

By R. S. SUTHERLAND, F.Z.S., R.A.O.U., Etc.,
Lighthouse, Cuvier Is., via Auckland, N.Z.

The object of these notes being to supply a ready means of distinguishing the immature examples of the several species, it may be as well in the first place to set out the species, and to offer some information on the points on which they differ. The following list includes all the species which have been named as distinct, but in this paper it is only necessary to deal with those marked thus *.

GENUS *EUDYPTES* (Vieillot).

- * *E. chrysocome* (Forster). Tufted Penguin.
- * *E. pachyrhynchus* (Gray). Crested or Thick-billed Penguin.
- * *E. sclateri* (Buller). Big Crested Penguin.
- E. filholi* (Hutton). Campbell Island Penguin.
- * *E. schlegeli* (Finsch). Royal Penguin.
- * *E. chrysolophus* (Brandt). Macaroni Penguin.
- E. vittatus* (Finsch). Thick-billed Penguin (Buller).
- E. atrata* (Hutton). Black Penguin.

Of the above, *E. filholi* is supposed to be synonymous with *E. chrysocome*; *E. vittatus* is said to be founded on a worn and faded example of *E. pachyrhynchus* (Catalogue of Birds, Brit. Mus. vol. 26); whilst *E. atrata* is only a melanism of either *E. pachyrhynchus* or *E. sclateri*.

The five species remaining may be separated into two groups:

I.—Tail composed of 16 feathers.

E. chrysocome
E. pachyrhynchus
E. sclateri

II.—Tail composed of 14 feathers.

E. chrysolophus
E. schlegeli

The two species comprising the latter group are easily distinguishable, for one—*E. schlegeli*—has the chin and throat ashy-white, whilst the other has these parts blackish.

In the former group the crests will, in nearly all cases, be sufficient to distinguish the species. In *E. chrysocome* the crest is long and straggling in appearance, and is never likely to be mistaken for the compact crests of either of the others. As a further distinction the eyes are crimson, not reddish-brown. *E. pachyrhynchus* and *E. sclateri* are much alike, but the following table will show their distinguishing characteristics.

	<i>E. pachyrhynchus</i>	<i>E. sclateri</i>
Feet	Dull flesh colour . .	Reddish-brown with the webs sometimes much darker
Bill	Reddish-brown	Very dk. reddish-brown
Size (in the flesh	26½ to 28½ inches in length	29½ to 31 inches in length
Head & hind neck	Dark bluish-black . .	Deep black (no edging of bluish on the feathers)
Upper back . .	Variable, light to dark blue-black	Dull blackish

The foregoing effectively disposes of the adult birds, but young birds in the immature plumage are not so easily or so surely distinguished.

I have examined the young of all the five species in the flesh, and at various ages, but of *E. pachyrhynchus* I can write with most certainty, for I have had a nesting colony under close observation for three consecutive seasons. As the state of the plumage at the end of each month from the time of hatching up till the time when the bird has fully acquired the adult plumage, does not appear to have been yet given in any ornithological work, and as it is only after these somewhat lengthy observations that I have been able to work it out completely, I give it in detail here.

At hatching.—The upper surface of the body is dull sooty black, the crown of the head, the throat and the chin are a deep but dull black, and the breast and abdomen are a dirty white. The outer surface of the flippers is as the back, and the inner surface is dull black marked irregularly with small patches of dingy white. These small patches vary in shape and extent in different individuals, and often also on the wings of the one bird. The bill is a dull black with the tips of both mandibles irregularly marked with ivory white. Separating this white from the black of the main part of the bill are small variable patches of dull crimson-red. The egg tooth is ivory white. The eyes are bluish—sometimes greyish-blue and sometimes china-blue. The feet on both the upper and under surfaces are dull black.

At the end of the first month.—The down has grown somewhat longer, but the colours are the same. The small white areas on the inner surface of the flippers are slightly larger in extent, and the extremities of the flippers are sometimes bare of down. The bill is entirely black—the reddish and the whitish at the tip, and the white egg tooth being lost. The eyes are dull brownish black. The webs of the feet with the exception of the front edges are dull leaden flesh colour, and dull black on the lower. The toes are still somewhat blackish on the upper surface.

At the end of the second month.—During the latter part of this month the tail feathers begin to sprout, and these are followed by the upper and under tail-coverts. The flippers are bare of down from the tips to within an inch or so of the shoulders along the front edges, whilst the under surfaces are still more plainly marked with white. The down-covered parts of the body are coloured the same as in the previous month; the bill is a trifle more robust, but still black, and the feet on the upper surfaces are almost entirely dull flesh colour. The eyes are dull brownish-black.

At the end of the third month.—There is a good growth of feathers on the breast and abdomen, the entire lower part of the back, and on the back between the shoulders. The feathers on the upper surface are bright blue with only faint median black stripes, and those on the under surface are silvery white. The space around the eyes is bare of down, and the tips of the down on the back of the neck and the crown of the head appear a pale sooty brown. The chin shows the first trace of the white feathers—under which feathers the skin is white—but the skin below the black down on the rest of the chin and throat is black. The flippers are almost clear of down, save at and around the shoulders, and the under surfaces have the markings almost similar to those of the adult. The feet and the eyes are as at the end of the last month, but the bill has a small portion of the under surface of the lower mandible (that nearest the chin) of a reddish-yellow colour.

At the end of the fourth month.—The young bird is fully feathered from the tail to just below the shoulders, both on the upper and under surfaces, though the white feathers of the upper breast are not yet fully spread out, and the skin can be seen between the close rows of feathers. On the centre of the back above the shoulders there is still a little down, but the back of the neck is partly feathered. The crown of the head is clear of down, and there is a further increase in the extent of the white on the chin. The cheeks are becoming feathered, but the black is crossed by several whitish lines—in some few birds the white appears to be more plentiful than the black. This white on the cheeks is not of a nature similar to that of the throat, but is due to the black feathers developing in separated and distinct lines across the cheeks, the lines of unexpanded feathers being occasionally from an eighth to a tenth of an inch apart. The feet are inclined to be more flesh (pinkish-flesh) coloured, and the eyes are as in the last month. The cutting edges of the mandibles are sometimes, but not always, dull brownish—otherwise the bill is the same as in the previous month.

At the end of the fifth month.—From the base of the skull along the spine to the shoulders there are still scattered bits of down, though often only a few wisps. The upper surface of

the body is bright glossy blue-black, with the crown of the head much darker and duller. The breast and the abdomen are silvery white, and the chin and throat are ashy-white or ashy-grey. This refers to only the vigorous chicks, for some backward ones have not at this time lost all the black on the throat. The area around the eyes is fully feathered, the eyes are dull brownish, and the feet and the bill are as in the previous month.

At the end of the sixth month.—The plumage generally as at the end of the previous month, but the throat and chin more whitish and only ashy on the sides. Near the base of the bill there is a slight return of the original black. The crest is just beginning to appear. It is usually canary-yellow, but is occasionally, and, I think only in weakly birds, yellowish-white or even dull white. More rarely the crest is tipped and streaked with fine black lines. The bill is gradually becoming reddish brown, but on the ridge of the upper mandible is still blackish, and the cutting edges are yellowish brown. The eyes are brown, and the feet are pale pinkish-flesh colour with only a faint trace of dull blackish on the front edges of the webs.

At the end of the seventh month.—The tail feathers which were originally developed have suffered much abrasion in the confines of the cave by this time, and during this month are partially renewed. The two outer ones—there are eight on each side—on each side are the first to fall, and these are followed by the inner one on each side. Six feathers out of the sixteen are renewed during this month, though in some birds two more feathers from each side of the tail are shed, but are not replaced by the end of this month. The general body plumage is as in the previous month; there is no further increase of the black on the chin, but the whitish lines across the cheeks are not nearly so prominent as in the fifth month. The crest is developing slowly—it still appears only as a yellow line commencing just above the eye, and extending about an inch and a half along the side of the head. The eyes and the feet are now as in the adult. The beak is reddish brown, of a shade somewhat duller than the bill of an adult, and there is still a trace of blackish on the ridge of the upper mandible.

At the end of the eighth month.—The upper and under tail coverts and the remaining feathers of the tail are in this month renewed; the black area on the chin is slightly greater in extent; and the crest is just a trifle wider, in consequence of which it shows much more plainly—otherwise a bird at the end of the eighth month is very similar to one at the end of the seventh.

At the end of the ninth month.—Towards the end of this month the plumage of the breast, the back and the abdomen undergoes a partial moult (only a small portion of the feathers being shed), and it is well on into the next month before the new plumage is

fully developed. The black has covered the chin, and has extended slightly on to the throat, and the crest can be seen extending very slightly beyond the head. The extreme tips of the feathers are sometimes black (about three birds in ten on an average). The bill is similar in colour to that of an adult, though in some cases the cutting edges of both mandibles are yellowish-brown.

At the end of the tenth month.—The black shows a still further return on to the throat. I should state here that what I have called black in connection with the throat would have been better described as greyish-black, for it is not until the end of the eleventh month that the chin and throat are really black as in the adult. There is a further slight development of the crest, and the white lines crossing the cheeks are absent.

At the end of the eleventh month.—Differs from the adult only in the following points: Shorter crest; slightly less robust and duller coloured bill; and in having the back of a brighter blue colour. Sometimes the crest at this time is equally as big as the smaller crests seen in some of the adults. The chin and throat are now as in the adult.

At the end of the twelfth month.—Young ones in their first year can still very often be distinguished from the old birds by the bill, which is sometimes duller coloured. The crest is well developed and usually clear canary yellow in colour, though occasionally (not more than one or two cases out of ten), very finely streaked and tipped with black. Some few young birds with fully grown crests have these showy appendages larger and more profuse than the adults—that is, they extend somewhat farther beyond the back of the head—in some young birds measuring from the base of the upper mandible to the extremity $4\frac{3}{4}$ or sometimes even 5 inches. This is from threequarters to one inch longer than in the general run of adults. The extra development is not, however, the normal course, as it occurs only in the very early and extra vigorous young ones. By the end of the thirteenth month from the time of hatching it is impossible to distinguish a young one from the adults of any age.

EUDYPTES CHRYSOCOME.

The young of this species appear to reach maturity, or rather, that stage when they are ready to take the water, in some few weeks less than the young of *E. pachyrhynchus*; young ones seemingly being ready to leave the land in from 15 to 18 or 19 weeks, and at this time the characteristic crest is beginning to appear. The component feathers are short—one and a half to two and a half inches in length—commence above and slightly in front of the eyes, and are often tinged with orange or even brownish, though light yellow with blackish tips is the more usual.

The change from the black throat and chin of the chick to the ashy-white of the young bird is at this time advanced to the same degree as in the previous species. The cheeks are not at any stage crossed with the whitish lines so conspicuous in *E. pachyrhynchus* at from four to eight months.

The black on the chin and throat is fully redeveloped before the end of the ninth month, and at this period the species is readily distinguishable, for the eyes have acquired their crimson colour, and the crest is straggling and typical of this species.

A young one of this variety at this age may be separated from an adult by the feet, which have the webs dull blackish, and not lead blue like the toes. After the eleventh month young ones cannot with certainty be distinguished from the adults.

EUDYPTES SCLATERI.

In passing to this species, I am upon safer ground. First as to the chin and throat. As in the nestlings of the two previously mentioned species, these parts are at first black, but this first black colouring is retained longer in this species than in any other. When once, however, the ashy-white begins to appear, the change is far more rapid, as is also the recurrence of the final black. The chin and throat reach the adult state in from seven to eight months.

Chicks when first hatched have the upper surface a deep dull black, not a pale sooty black like those of *E. pachyrhynchus* or *E. chrysocome*. The under surface is white, and the bill is blackish, with a whitish tip, but without the crimson so noticeable on the bills of the chicks of *E. pachyrhynchus*. The feet are at first blackish on both the upper and under surfaces, but the upper surfaces change during the third or fourth months to a dull reddish pink with darker webs. Shortly after this the reddish brown is acquired, but it is not until the tenth month or even later that the feet are similar to those of the adult. The crest is at all times short, narrow and very compact. The bill is, after the sixth month, dull brownish with the ridge of the upper mandible somewhat darker—this latter being a feature noticeable in some fully adult birds. The eyes are dull, but dark brown.

EUDYPTES SCHLEGELI.

The chicks of this species have the down of the upper surface smoky brown, much lighter or ashy brown or grey on the chin and throat. The under surface is dull white. The bill and the feet are sooty black. At about the third month the throat is ashy-grey, the chin is still smoky brown, and the feet are dull yellowish flesh colour.

At about the seventh month the chin is ashy-white, the centre of the throat is white, like the upper breast, but the sides of the

throat are ashy-white. At this age the upper surface of the body is brownish black, the chin and throat, the lores, and the sides of the head and neck are ashy-white, and the breast and abdomen are pure white. The crest is noticeable as a narrow line of light yellow commencing just above and behind the eyes, and extending backward about two inches. The feathers are inclined to be straggling, and with the lengthened frontal feathers give the head a ragged appearance. Some of the frontal feathers are pale yellow heavily marked with black, and are somewhat pointed in outline. In the fully adult bird the colour of the crest and the frontal feathers inclines more to orange than to canary yellow, and young birds under about the age of ten months may be so distinguished, for they have the crest pale yellowish (sometimes very finely streaked with black, but more often only tipped with that colour) and a small portion of the frontal feathers blackish, and only sparingly marked with yellow.

EUDYPTES CHRYSOLOPHUS.

This species is only observed as a straggler on the mainland of New Zealand, but is rather more frequently met with than is supposed. In the adult state it can at a glance be separated from all the other crested penguins by the shape of the line of juncture of the black of the throat and the white of the upper breast. This line is not straight across the throat, but is V-shaped. This feature, owing to the fact that it is not acquired until about the end of the seventh month, is not of any use in distinguishing the immature examples. Up to the time of the losing of the first black on the throat and chin—between apparently the end of the second and third months—the chicks show this characteristic marking; so that it is only necessary to write of the young ones from the age of three up to seven months. This I cannot do in any detail, being only able to refer to one specimen, which is from a reliable source, and stated to be between five and six months old.

It may be described as follows: The back bluish-black, becoming darker on the front and crown of the head; sides of the throat ashy-white (a faint trace of blackish at the base of the lower mandible), and the breast and abdomen pure white. The feathers of the crest commencing just above the eye; orange yellow in colour and with pointed blackish tips. On the crown of the head, between the eyes, the feathers are only slightly lengthened, and are blackish in colour with only faint indications of yellow. Bill (dried skin) reddish brown, but much lighter in shade than in any of the other species. The ridge of the mandible is dull blackish, and the feet are dull flesh colour.

In "A Manual of the Birds of Australia" (Mathews and Iredale) is listed *E. schlegeli*—a single specimen only, and an immature one at that. This bird I am inclined to think is not

E. schlegeli, but *E. pachyrhynchus*. I am indebted to the owner of this straggler, Mr. H. Stuart Dove, F.Z.S., for a photograph of the mounted specimen, and also a reprint of his original notice of the bird. (The Crested Penguin—*C. chrysocome*, Forster—in Australian Waters. *Ibis*, 1915, pp. 86-88.) The author says: "In my specimen I should describe the upper surface as a fine dark metallic blue, upper surface of wings the same, tail somewhat lighter blue; under surface silvery white, except the throat and chin, which are ashy-white, with a small dark patch a little below the base of beak. Sides of the head below the crest, a darkish grey; forehead, bluish grey. The wings above are of the same tint as the back; beneath, white, with broad patch of dark blue at the tips, the same at the base, extending somewhat on to body in front of wing; there is also a border of dark blue on the upper edge, but not extending to the tip. Beak dark red, feet reddish, webbed, with strong nails. The tail is long for a Penguin, and formed of stiff, narrow feathers. The crest is black, formed of fine pointed feathers, the pale yellow appearing only underneath, and beginning behind the eye." In a letter to myself, Mr. Dove says, "There is a narrow border of yellow along the edge of the upper mandible."

In the foregoing description the following points are deserving of special notice: (1) Except the throat and chin, which are ashy white, with a small dark patch a little below the base of beak; (2) sides of the head below the crest, a darkish grey; (3) feet reddish; (4) the crest . . . beginning behind the eye; and (5) a narrow border of yellow along the edge of the upper mandible.

Point No. 1 shows at once that this bird cannot be *E. schlegeli*, for that species has the chin and throat ashy-white in the adult, whereas the specimen under review has a small dark patch a little below the base of the beak. In *E. chrysocome*, *pachyrhynchus*, *sclateri* and *chrysolophus*, as I have shown, the chin and throat are in the nestling, black. This black is lost by very gradual stages until the chin and throat are ashy-white, which colour is retained for only a short period. After this the black begins to reappear, and invariably commences just a little below the base of the bill, but not quite at the base. This leads to the conclusion that the bird is any species other than *E. schlegeli*. This is further supported by point number 2, for in *schlegeli* the sides of the head, that is, between the crest and the eye, and also below the eye, are dull brownish. *E. pachyrhynchus* has the cheeks crossed with dark greyish in about five out of ten specimens between the ages of five and eight months, and immature examples of *E. chrysocome* have the sides of the head and the cheeks bluish grey, whilst odd specimens only of *E. sclateri* have these parts a dark dull grey. Point number 3 can refer only to an example of *E. sclateri*, for in no other species of any age are

the feet reddish. Immature specimens of all the species, with the exception of *E. sclateri*, have the feet of a pale flesh colour, which has a yellowish tinge in *E. schlegeli*. However, we need not attach a great deal of importance to this point, for I understand the bird was picked up dead, and there is the possibility that immersion in the sea would affect the colour of the feet. Point number 4, the crest commencing behind the eye, points to *E. pachyrhynchus*, and tends to show that the bird is not either *E. schlegeli* or *E. chrysolophus*. Point number 5, a narrow border of yellow along the edge of the upper mandible, is noticeable only in *E. pachyrhynchus*, to which species, I think, I may safely say, this straggler belongs.

List of the Birds of the Murrumbidgee Irrigation Areas

SEPTEMBER, 1915, TO JANUARY, 1921.

By K. McKEOWN, R.A.O.U., "The Hydro," Leeton, N.S.W.

The following list of birds occurring on the Murrumbidgee Irrigation Areas, together with the brief notes on the various species, are compiled from notes and observations covering a period extending from September, 1915, to January, 1921, and although it makes no claim to be a complete list, yet it will be found to contain all species normally found on the area. It is certain, however, that further species will be added to the list from time to time, in the way of casual or accidental visitors.

For purposes of bird survey the Irrigation Area may be conveniently divided into (a) the closely settled country which has been almost completely cleared and which consists chiefly of deciduous and citrus orchards, with some dairy farms. Sugar gums have been extensively planted in the avenues and as wind-breaks to the farms and form good shelter for birds. In this section are a few scattered swamps where the timber is more of the type in Class (c); these if gazetted would prove invaluable as bird reserves; (b) the dry area—chiefly grazing land, with stunted Box, Boree, Cypress Pine, etc.; and (c) the river frontage country on North Yanco, which is heavily timbered with Red Gum, etc., and has a heavy undergrowth of Red Gum seedlings and is ideal country for birds; and (d) a section of the Macpherson Range behind Griffith, timbered with Box, Cypress Pine, She-oaks, Quandongs, etc.

Owing to extensive clearing and indiscriminate shooting, many species are becoming much reduced in numbers, and it is only

a matter of time before several species become practically extinct on the area. Old nests of the fine Wedge-tailed Eagle have been observed in the Macpherson Range at Griffith, but the bird is no longer to be seen.

In an area almost entirely devoted to fruit growing, birds are of the utmost economic importance—freedom from insect pests depending on our insectivorous birds, which should be rigorously protected. This, however, is unfortunately not at present the case, all birds suffering from the indiscriminate gunman, and lack of suitable reserves. Almost all our native birds are insectivorous in their habits, and are therefore of the greatest value. Too much stress cannot be laid on the value to the area of Cormorants, Herons, Spoonbills, Ibis, etc., as destroyers of fresh-water Crayfish or "Yabbie," which cause great damage to the uncemented channels, causing seepage by tunnelling in the banks.

Starlings are our worst bird pest, and destroy large quantities of soft fruits to the value of many pounds annually. Ravens also do considerable damage to peaches, grapes, etc., and injure the trees by perching on them and breaking the branches; they are also recorded as pests of apples and watermelons. Honey-eaters destroy soft fruits in exceptional seasons, but not to any great extent. Sparrows and Galahs are serious pests of grain crops, etc.

To date no reports have been received of damage by Silvereyes and Goldfinch.

Droughts have been responsible for several invasions of birds. The Emu appeared on the area in considerable numbers in 1919-1920, and in the summer of 1917-1918 exceptional numbers of Water-Hens and Wood Ducks (flocks numbering many hundreds) were observed, the latter doing damage to sprouting pea crops, which had been planted to supply the Commission's Canning Factory.

Dromaius novæ-hollandiæ. Emu.—This bird is usually rare on the Areas, but under drought conditions a few may occasionally be seen on outlying parts of the Area. During the drought of 1919, however, hundreds of these birds were driven in on to the "dry areas" by the scarcity of food and water—several hundred being observed in one paddock alone. At a conservative estimate there must have been at least 500 of these fine birds on the country between the northern boundary of the Yanco Area and the Whitton Stock Route.

Coturnix pectoralis. Stubble Quail.—Common in open grass land, drainage reserves, etc. All my notes on this bird go to show that it is of great value in the destruction of weed seeds, etc.

Geopelia placida. Peaceful Dove.—Rare. Observed only on North Yanco.

Ocyphaps lophotes. Crested Pigeon.—These fine birds nested in fair numbers in Needlewood trees in McCaughey Park, and both adult and young birds were fairly numerous during the autumn of 1920.

Hypotaenidia philippensis. Buff-banded Landrail.—Common near swamps and drainage reserves in some seasons, but irregular in appearance.

Porzana plumbea. Spotless Crake.—Rare in swamps, etc.

Gallinula tenebrosa. Black Moor-Hen.—Common in swamps, etc. During the summer of 1918-1919 this bird appeared in large flocks, numbering many hundred of birds in each, and were probably driven in by the drought conditions then prevailing outside the Irrigation Areas.

Fulica atra. Coot.—Rare.

Lobibyx novæ-hollandiæ. Spur-winged Plover.—Fairly common in similar country to the succeeding species, but occurs in isolated pairs, while the Banded Plover is usually in small flocks.

Zonifer tricolor. Banded Plover.—Fairly common on open grass land, i.e., Butter Factory Paddock and Dry Area.

Charadrius melanops. Black-fronted Dottrel.—This valuable little bird is usually rare along channel banks, but in some seasons is fairly common in swamps and similar localities. It has a curious habit of flying about at night uttering its distinctive note.

Recurvirostra novæ-hollandiæ. Red-necked Avocet.—This species appears in Captain White's list, but does not appear in any of my notes.

Burhinus magnirostris. Southern Stone-Plover.—This very useful bird is rapidly becoming extinct in the district, and it appears to be only a matter of time before it is completely so. Some years ago it was fairly common in open country, i.e., Butter Factory Paddock when well grassed. Cultivation and ruthless destruction are responsible for the disappearance of this bird.

Antigone rubicunda. Brolga or Native Companion.—Usually rare, and seldom seen except when driven on to Area by drought conditions. During the 1919 drought this bird was comparatively numerous and about 50 were observed.

Threskiornis molucca. White Ibis.—Rare on channel banks, swamps, etc.

Threskiornis spinicollis. Straw-necked Ibis.—Common in swamps, open country, and channels. One of the most valuable birds on the Area in the destruction of fresh-water Crayfish or "Yabbies," also in keeping in check grasshoppers, etc., on open grass land. During 1915-1916 Ibis were frequently seen on the channel banks near the town.

A representation of a Straw-necked Ibis has been appropriately used by the Water Conservation and Irrigation Commission as the trade mark of products of the Irrigation Areas.

Platalea flavipes. Yellow-billed Spoonbill.—Fairly common along channel banks, in swamps, etc.; frequently in company with the Straw-necked Ibis—two or three Spoonbills with a flock of Ibis.

Notophoxyx novæ-hollandiæ. White-faced Heron.—One of our commonest birds in the irrigation channels and is invaluable in the destruction of the freshwater Crayfish or "Yabbies," which damage the channel banks by tunnelling in them and thus causing seepage. It is often wrongly called the Blue Crane.

Notophoyx pacifica. White-necked Heron.—Common in similar situations to the preceding species, and like it in habits.

Nycticorax caledonicus. Nankeen Night Heron.—Rare. In swamps.

Chenopsis atrata. Black Swan.—Very rare. Occasionally observed in swamps.

Chenonetta jubata. Maned Goose or Wood Duck.—Common in swamps, creeks, etc. In the summer of 1918-1919 Wood Duck appeared in large numbers and did considerable damage by digging up and feeding upon sprouting peas, planted for the Canning Factory. In this case, as in others, dry conditions and lack of natural food appear to have been responsible for the change in habit.

Anas superciliosa. Grey (Black) Duck.—Not usually common, but fairly plentiful in some seasons.

Virago gibberifrons. Grey Teal.—Our most plentiful duck. Common in most seasons, but indiscriminately killed, like other species in "open season." Late breeding in dry seasons is responsible for the death of many young ducks, which perish when the parents are shot.

Phalacrocorax carbo. Black Cormorant.—Common. All species of Cormorants are of the greatest value on the Irrigation Area, and their protection cannot be too strongly urged. Although they destroy fish, the damage in this district is quite out-balanced by the destruction of fresh-water Crayfish, and they are in this respect probably the most valuable of our birds in the protection of channels from this pest.

Phalacrocorax ater. Little Black Cormorant.—Rare. Occasionally observed in company with the Black and White Cormorant.

Microcarbo melanoleucus. Little Pied Cormorant.—Our most common Cormorant. Frequently to be seen in large flocks sitting on bridges and regulators on channels. All remarks on the Large Black Cormorant as to its value as a destroyer of Crayfish are equally applicable to this species.

Circus approximans. Swamp Harrier.—A fairly common bird in swamps, etc.

Astur fasciatus. Australian Goshawk.—Not common.

Haliastur sphenurus. Whistling Eagle.—This fine bird is unfortunately not common. Usually observed in timbered country.

Elanus axillaris. Black-shouldered Kite.—Very rare. My only note of this species is of a pair breeding on Farm 327 in the summer of 1919.

Cerchneis cenchroides. Nankeen Kestrel.—Fairly common in swamps and open dry area. A very valuable bird.

Tyto alba. Barn-Owl.—Very rare. Occasional specimens are brought into the office to me for identification, having been picked up dead. These Owls appear to suffer from a liver disease resembling that of domestic turkeys, etc.

Cacatua galerita. White Cockatoo.—Rare. Only observed on North Yanco.

Cacatua roseicapilla. Galah.—Very common, in large flocks, and sometimes causing considerable damage to crops.

Leptolophus hollandicus. Quarrior or Cockatoo Parrot.—Fairly common in some seasons.

Polytelis swainsoni. Superb Parrot (Green-Leek).—Very rare. Observed only on river-flat country on North Yanco.

Platycercus eximius. Rosella.—Occurring in small flocks of three or four—not common.

Barnardius barnardi. Ring-necked (Mallee) Parrot.—This bird appears on Captain White's list, but has not been noted by me.

Pezoporus wallicus. Ground Parrot.—A common bird on grass land or lightly timbered country. A valuable destroyer of weed seeds, etc.

Melopsittacus undulatus. Budgerigah.—Very common in the summer months in large flocks, feeding on grass seed.

Dacelo gigas. Laughing Kookaburra.—Very rare. Probably driven out of the area by extensive clearing. Most numerous on North Yanco.

Halcyon sanctus. Sacred Kingfisher.—Rare. Occasionally observed on channels and on river frontages, North Yanco.

Merops ornatus. Rainbow Bird.—Valuable insect destroyers, common in summer months in orchards and along roads.

Cuculus pallidus. Pallid Cuckoo.—Rare. Occasionally observed in timbered country, July and August.

Lamprococyx plagosus. Bronze Cuckoo.—Very rare, July and August.

Hirundo neoxena. Welcome Swallow.—Common, but generally replaced by the Fairy Martin.

Hylchelidon ariel. Fairy Martin or Bottle Swallow.—One of our commonest birds. In the spring months after rain these birds may be seen in many hundreds along the roads collecting mud for their nests, which are built under verandahs, bridges, over channels, etc. Very valuable destroyers of insects, especially mosquitoes, etc.

Microeca fascians. Jacky Winter (Brown Flycatcher).—Rare.

Petroica goodenovii. Red-capped Robin.—Fairly common in spring months in orchards, cypress pine scrub, etc. A very valuable insect destroyer.

Rhipidura flabellifera. Grey Fantail.—I have only one record of this bird—one specimen being noted on 26/6/20. Probably accidental on Area.

Rhipidura leucophrys. Black and White Fantail or Willie Wagtail.—Very common, and one of the most familiar birds throughout the Area, nesting freely about houses, etc. A very valuable bird.

Seisura inquieta. Restless Flycatcher.—Fairly common. Insectivorous.

Pteropodocys maxima. Ground Cuckoo-Shrike.—Rare. I first noted one pair of this bird in August, 1919, and have since observed not more than about a dozen of these birds altogether.

Graucalus novæ-hollandiæ. Black-faced Cuckoo-Shrike.—Not common.

Campephaga tricolor. White-shouldered Caterpillar-eater.—An exceedingly valuable bird. Common in spring and early summer, nesting in large numbers in Cypress Pine (*Callitris*) scrub, etc.

Pomatostomus temporalis. Grey-crowned Babbler or Fussy.—Fairly common in Pine scrub, etc., but only occasionally in orchards. A very valuable bird.

Pomatostomus superciliosus. White-browed Babbler.—Similar in habits, etc., to the preceding species.

Cinclorhamphus cruralis. Brown Song-Lark.—Rare. Observed in November and December.

Cinclorhamphus mathewsi. Rufous Song-Lark.—Not common.

Epthianura albifrons. White-fronted Chat.—Common along roadsides, etc. A valuable bird in orchards.

Acrocephalus australis. Reed Warbler.—Common in swamps and reed beds, also in weeds on channel banks. This fine bird nests freely wherever there are reeds, and it is undisturbed; but I have notes of one nesting in November, 1919, in a clump of bamboos in the garden of the official quarters in the town of Leeton. Very numerous in swamps on North Yanco.

Geobasileus chrysorrhous. Yellow-tailed Thornbill.—Common in orchards, gardens, etc. A very valuable destroyer of small insects.

Artamus leucorhynchus. White-breasted Wood-Swallow.—Rare.

Artamus superciliosus. White-browed Wood-Swallow.—Rare.

Artamus personatus. Masked Wood-Swallow.—Rare.

Artamus cinereus. Black-faced Wood-Swallow.—Rare.

Artamus cyanopterus. Dusky Wood-Swallow.—Very common in summer months, and is a very valuable bird in orchards, etc., in company with the above-mentioned species, which are, unfortunately, rare. This bird nests freely on the Area.

Colluricincla harmonica. Grey Shrike-Thrush.—This fine bird is, unfortunately, very rare on the Area, and I have only observed it on North Yanco.

Grallina cyanoleuca. Magpie Lark.—A very common bird throughout the Irrigation Area, and a very valuable insect destroyer. These birds occurred in large flocks, ranging in number from 20 to 50, during the spring of 1919; these flocks ultimately split up into the normal pairs.

Struthidea cinerea. Apostle Bird.—A useful bird, but only observed in Pine scrub, etc., where it is fairly numerous at present, but its number are rapidly becoming reduced.

Oreoica cristata. Crested Bell-Bird.—Rare. Observed in the Macpherson Range at Griffith.

Pachycephala rufiventris. Rufous-breasted Whistler.—Rare. Pine scrub.

Aphelocephala leucopsis. Whiteface.—Fairly common throughout the Irrigation Area in gardens, orchards, etc. A very useful bird.

Climacteris picumna. Brown Tree-Creeper.—Unfortunately unknown on the settled portion of the Irrigation Areas, due to extensive clearing, and becoming scarce on the timbered country—most numerous on river frontage country on North Yanco.

Zosterops lateralis. Silver-eye.—First observed on the Area in July, 1920, when several flocks averaging about 50 per flock were observed. Should this bird appear in large numbers it is liable to become a serious pest to soft fruits.

Pardalotus, (sp.) Pardalote or Diamond-Bird.—Common in large timber in swamps, river frontage, on North Yanco, etc.

Plectorhyncha lanceolata. Striped Honey-Eater.—Fairly numerous in Sugar Gum windbreaks when in blossom.

Meliphaga ornata. Yellow-plumed Honey-Eater.—Appears on Captain White's List, but I have no notes on this species.

Meliphaga penicillata. White-plumed Honey-Eater.—Not common. Occasionally damages soft fruits in bad seasons.

Myzantha garrula. Noisy Miner or Soldier Bird.—Rare, in timbered country.

Acanthagenys rufogularis. Spiny-cheeked Honey-Eater.—Common in Sugar Gums in avenues and windbreaks, when in blossom. Destructive to grapes in dry seasons, being very daring, coming right in to vines trellised on verandahs, etc.

Philemon corniculatus. Noisy Friar Bird.—Rare; observed only on North Yanco.

Philemon citreogularis. Little Friar Bird.—Rare, only noted on North Yanco.

Anthus australis. Australian Pipit.—Unfortunately rare and seldom observed.

Zonaeginthus guttatus. Diamond Firetail or Spotted-sided Finch.—A fairly common bird in some seasons.

Taeniopygia castanotis. Chestnut-eared or Zebra Finch.—Occurred in large numbers in 1915-16-17, and again in 1920. Nests on the Area.

Corvus coronoides. Australian Raven.—Very common throughout the Irrigation Area, and may be seen in large numbers on flooded country apparently seeking drowned insect life, etc. Destructive to fruit and also does considerable damage to fruit trees, breaking branches by perching on them. Peaches, grapes, etc., suffer to the greatest extent from their depredations. In the summer of 1918-1919 they damaged apples, while still green, by pecking large pieces from them. They also destroyed water melons, opening them as soon as ripe and feeding on the sweet flesh. One of our worst pests.

Corcorax melanorhamphus. White-winged Chough.—Fairly numerous in Pine scrub and timber country, but rapidly decreasing in numbers.

Strepera graculina. Pied Bell-Magpie or Black Magpie.—A rare visitor to the Areas; my only notes on this bird are on their appearance in large numbers in July, 1920—the only occasion during five years' residence on the Areas. Their arrival was very generally commented on, though the birds only remained a few weeks.

Cracticus torquatus. Grey Butcher-Bird.—Not common, but occasionally observed in Cypress Pine (*Callitris*) scrub and open timber.

Gymnorhina tibicen. Black-backed Magpie.—Not common, but a valuable insect destroyer. Unsubstantiated reports of damage done to sprouting crops are occasionally received, and such observations as I have made tend to disprove them completely, but in any case the good done far outweighs the harm, if any.

INTRODUCED BIRDS.

Passer domesticus. House Sparrow.—This bird first made its appearance on the Irrigation Areas about 1916. Destructive to crops, and is proving a great pest.

Sturnus vulgaris. Starling.—Appeared on the Irrigation Area late in 1916. This bird is rapidly becoming our worst fruit pest, and drastic action will have to be taken to keep them in check.

Carduelis carduelis. Goldfinch.—First appeared on the Area early in 1920, and is becoming fairly numerous. It does good work in the destruction of thistle seeds, but will need careful watching—no damage to berry fruits has yet been reported.

NATIONAL MUSEUM MELBOURNE



The Paperbark Teatree (*Melaleuca*) Patch

Photo by N. F. Chaffer, R.A.O.U., Victoria Av., Willoughby, N.S.W.

Birds of a Melaleuca Patch

By N. CHAFFER and H. WOLSTENHOLME, Ms.R.A.O.U.

On 18th October a day was spent near St. Mary's, a small township about 30 miles west of Sydney, on the flat country, not far from the Blue Mountains. Conspicuous in a large cleared area containing dead trees and a great many stumps, where Brown Treecreepers (*Climacteris picumna*) were plentiful, and where there were hardly any other living trees, stood a little clump of Paper-barks (*Melaleuca leucodendron*) — oasis-like, with thick green foliage and deep cool shade. Some two dozen shapely trees, about twenty-five feet high, were growing close together in an irregular oval that could be placed inside a tennis court. It looked a good place for birds, and before we reached it we could see a bird gathering hair from the back of a cow standing under the trees. This was found to be a Fuscous Honeyeater (*Meliphaga fusca*), and it flew off with a mouthful of hair to its nest in course of construction in a sapling some distance away. We spent a great part of the afternoon lounging in the cool shade of the trees and observing their bird occupants. Very strangely those whose nests were found were all black and white birds, five species in all. Magpie-Larks (*Grallina cyanoleuca*) and Black and White Fantails, or Wagtails (*Rhipidura leucophrys*) had their nests within six feet of each other in the same tree, as is often the case. A few trees off a Scissors Grinder or Restless Flycatcher (*Seisura inquieta*) was sitting closely on a nest and three eggs, about twenty-five feet up. An attempt was made to photograph this bird. The camera was lashed to a branch near the nest, and a line dropped to the ground from the shutter release. The bird, however, proved very timid, and did not once pay a visit during the two hours the camera faced the nest, though it kept in the vicinity all the time.

In another tree close by, busy making their nest in a fork on a horizontal branch, was a pair of White-shouldered Caterpillareaters (*Campephaga tricolor*). Rather slim birds they are, like Honeyeaters in build, and very handsome when seen closely. The pure white of the male—all the under surface right to the eye and beak, shoulders also and upper wing—is very striking, especially if the bird is above one, when the black (in some lights greenish) of the crown and top of back is hardly visible. The female is of a showy brown colour, with pretty markings, especially on the wings, and fainter markings on the buffy white under surface. The pair seemed happy and affectionate, and they had attractive ways. They were always in company when gathering material, and were quite close together when arranging

it at the nest, a small shallow structure. The male would at times stroke his mate's back with his bill. Leaving the nest, they would float away gently (like a Wood-Swallow) with wings outstretched and motionless, uttering the while a sweet canary-like song. These happy, domestic proceedings were rudely interrupted by the arrival on the scene of a second female bird, and for fully a quarter of an hour a strenuous fight went on between the two brown birds. They made quite a disturbance among the other bird occupants as they chased each other from tree to tree. Sometimes they dropped to the ground locked together, and wrestling there like two sparrows, while little bits of fluff floated away; sometimes they rested a moment and panted, with mouths agape, as they eyed each other for the next attack. The male took no part in the affair beyond following the two female birds closely wherever they went. Eventually the intruder flew off, and the nest-building was resumed.

The fifth black and white bird was the Hooded Robin (*Melanodryas cucullata*). In coloration the male bird is similar to the male Caterpillar-eater, but the whole throat and head of the Robin is black, while in general appearance it is a typical Robin. In flight, when viewed from the rear, the two birds offer a close resemblance. The female is a kind of ashy colour, under surface lighter. On the wing the male is a pretty sight, especially if flying away from one, when the moving wings and the blending of the black and white produce a beautiful effect. These birds had a nest in the first fork of a large Paper-bark, about seven feet from the ground, in a position that was shaded and awkward to photograph. One large young bird was in the nest and another was found dead on the ground below. The nest was larger and less compact than those of other Robins. We were surprised to see two male birds gathering food for the young bird. One was sleeker and more handsome than the other. One often fluttered about the ground a little distance from us, with feathers ruffled, apparently to divert our attention from the nest. Sometimes, it would drop vertically to the ground in a seemingly helpless manner from a branch, and flutter around the base of the tree, pausing occasionally to see what effect its manœuvres had upon us. Both male birds kept together a good deal, and were on the friendliest of terms.

The House Shortage Again.—The cry of house shortage has become so common that it has spread to the bird life in the North-west of Western Australia. On September 6th, 1922, at the Homestead, Yalobia Station, I noticed a Chestnut-eared Finch's nest which contained 25 eggs. I saw a considerable number of other nests, with anything from 10 to 15 eggs in them.—E. A. W. TUBMAN, R.A.O.U., Cooralyn Station, W.A.

Remarks on Storm Petrels

By GREGORY M. MATHEWS, F.R.S., Ed.

In *The Emu* for October, 1922 (vol. xxii., pp. 81-97), Messrs. Kinghorn and Cayley have given a summary of their conclusions upon some debatable points in connection with these puzzling birds. Notwithstanding their detailed account the matters at issue are not so easily settled as would be judged by their essay. I am pleased to see the research and study shown, but would have liked to see the subject developed more completely. It is easy with one or two specimens to decide all the difficult problems in the Petrel group, but with a lot of material the difficulties become so complicated that great care must be taken lest others be misled. Loomis has shown this clearly, as with little material he has lumped in the most inconsequential manner and has misled the worker who cannot confirm his statements with adequate material. Loomis's conclusions, based upon a few *Galapagos* species, are not applicable to every Petrel, and in this group little value can be adduced by analogy. Messrs. Kinghorn and Cayley have scarcely stated the cases fairly, as I am accused of confusion when as a matter of fact I was the first to dispel the confusion. It is necessary to study the literature of this subject carefully, and until I monographed this group in the *Birds of Australia* this had never previously been done. That account was practically a pioneer effort, as will be gauged if it be carefully studied. Considering the matter of the study of this group, an important one for Australian ornithology, I would have liked to leave unnoticed Messrs. Kinghorn and Cayley's paper, rather than it should be thought that I wished to criticise it adversely. Upon reflection, however, I have thought it best to remark upon their conclusions, but wish it to be known that these remarks are for the benefit of the truth, and are not antagonistic in any way. As above noted, I am delighted to see their interest, and hope it continues.

The character they have noted as to the comparative length of the outstretched legs and the tail depends upon the "make-up" of the skin, and little attention should be paid to it. When the figure of *Fregetta grallaria* was painted for my work I had not undertaken the detailed study of the group, and the painting was made by Keulemans, who had just completed *The Monograph of Petrels* for Godman; the matter of the toes was overlooked, as it had been by all previous workers. I was the first to note the difference and describe it, but the plate was then printed off and ready for publication.

As far as I can judge, Messrs. Kinghorn and Cayley base their conclusions upon three specimens. This is quite insufficient. I have examined nearly *ten* times as many, and I am not satisfied with the results, because like Messrs. Kinghorn and Cayley I

wanted to make them all one species, and the material would not allow it.

Vieillot's localities are not definite, and although Messrs. Kinghorn and Cayley write that Vieillot definitely states that his bird came from New Holland, it must be remembered that Vieillot simply gave the information that was on the museum labels, and these were confused and in every case are not correct. I carefully examined the type of Vieillot's species with all the specimens available at the time, and it did *not* agree with any Australian skin then known, but agreed in detail with South American skins. The white tips on the feathers of the back were at that time regarded as of specific value.

Here again I was the only worker of recent times to examine Vieillot's type, and to establish its identity.

I am taking the items as they appear in Messrs. Kinghorn and Cayley's paper for ease of reference. The shrunken nasal tube is of interest, but it is not yet explained why the nasal tubes should shrink in these Lord Howe's specimens *only*. In the numerous other specimens available no such shrinkage is known. It is definite from Messrs. Kinghorn and Cayley's experiment that the nasal tube of the Lord Howe birds is of softer texture than that of other Storm Petrels.

When the coloration is treated, Messrs. Kinghorn and Cayley are on debatable ground, and I have both immature in down and adults showing fixed coloration, so that the suggestion that the bird moults into different colours is negligible at present. The series of birds I examined showed a little variation, but none that could be regarded as definite of intergradation. Of course, through lack of specimens, and knowledge of the variation of the species, they have concluded to lump, but this is not necessarily the correct attitude. I will give details of the birds later on. In this group the criticism of descriptions is often misleading, as will be seen from a careful study of my work in *The Birds of Australia*. Loomis has in my opinion lumped very distinct species of Albatrosses through the same fault.

Messrs. Kinghorn and Cayley have written: "Bonaparte wrongly placed *T. leucogaster*, Gould, as a synonym of *P. grallaria*, Vieillot, and this mistake has been continuously accepted since that time. Here they should have added—until Mathews in his *Birds of Australia* clearly separated them. Later, several specimens collected by the *Challenger* Expedition were identified as *F. grallaria*, instead of *F. leucogaster*, an action which has caused most of the trouble since, as authors have evidently followed this lead." This sentence is incorrect, as the birds collected by the *Challenger* were mostly *grallaria*, as I have shown, and the South American birds were the ones I regarded as typical *segethi*, a name ignored by Messrs. Kinghorn and Cayley. They are *not leucogaster*, but are *grallaria*. They next refer to my remarks upon the white tips, and I agree at once that

these appear contradictory, as I was of their opinion that they were "due to variation caused by wear or tear, or due to moult or age." Unfortunately the matter cannot be so easily disposed of, as recent material shows these white fringes in both adult and young, while other birds both in the adult and nestling stage never show them. The true *grallaria* has the white fringes, and Loomis's bird, from near the Galapagos Islands, if it were placed at all correctly, might be near this. Loomis's descriptions are so confusing, owing to his "dual coloration" fantasy, that no reliance can be placed upon any of them. Messrs. Kinghorn and Cayley, without seeing the specimen named *tubulata* of Gould, have concluded it was referable to *tropica*, but I might note that when Mr. W. B. Alexander saw the bird in the British Museum he was not inclined to lump it. I am not at all prejudiced on this subject, but I would point out that the important conclusions in Messrs. Kinghorn and Cayley's paper agree entirely with those I first put forward in my *Birds of Australia*, and the matters wherein they disagree are not definitely decided, as their material was inadequate upon which to form any conclusion. Thus as the material here is inaccessible to Messrs. Kinghorn and Cayley, the following details may interest students.

Firstly, Vieillot's *P. grallaria* was described by myself, and the figure given in my *Birds of Australia* was taken from a specimen critically compared with the type specimen by me, the first comparative examination of Vieillot's type undertaken by any recent worker. By means of this I separated the form named *leucogaster* by Gould, which had previously been regarded as an absolute synonym. My specimen turned out to have a fictitious locality, a common error in those days. The notable features in connection with the present review are the white tips to the feathers of the back and the large white lining to the wing. The dark coloration of the throat is comparatively restricted to the throat and upper breast. No specimens from Australian Seas were at that time in the museums whose collections I studied, but a series of birds collected for the *Challenger*, off Chili, South America, agreed closely. Specimens presented to the British Museum by Sir George Grey, collected at sea, were labelled "South Australia" but were probably secured off the South African Coast, as we know other Petrels so labelled and presented at the same time were. These specimens did not agree exactly with Vieillot's type, but were very close and apparently of the same species. These also had the white tips to the feathers of the back and the large white lining to the wing.

The specimen I named *Fregettornis innominatus*, from Lord Howe Island, and which I have since regarded as con-specific with Vieillot's *P. grallaria*, shows white tips to the feathers of the lower back only, white tips to the larger wing coverts, and

secondaries, and on some of the under tail coverts and the white lining of the wing not quite so extensive. Other specimens from Lord Howe Island received since that was named have much more pronounced and broader white tips to the feathers of the back and the wing coverts and broad white tips to the feathers of the under tail.

The specimens collected by the *Challenger* in lat. 37 deg. 29 min. S. and long. 83 deg. 7 min. W. (off Chili, S. America) agree with each other and are typical of *segethi*, Philippi and Landbek. These were recorded as *Fregetta grallaria* by Salvin, without comparison with the type, as he confused Gould's *leucogaster* and used *grallaria* as the older name. As a matter of fact these agree so exactly with Vieillot's type that I preferred to sink *segethi* as an absolute synonym of *grallaria*, and considered Vieillot's bird to have been collected somewhere off the South American Coast. In these specimens the feathers of the back have broad white edges, but there are none on the larger coverts, which are brownish, and none on the under tail coverts, while the white wing lining is extensive as in the type.

Now as to wear. The most extensive white tips are seen on the bird which is obviously in the freshest and most perfect state of plumage, but they are retained in a specimen which shows wear, and are notable on the back of the South American birds, though they are presumably worn clean off the lesser wing coverts. An interesting bird in the Rothschild Collection, from near Tristan d'Acunha in the South Atlantic, may be mentioned. It agrees in the short toes, but the scutation on the tarsus is indistinct; the back feathers have the white tips, but the greater wing coverts have not, and are brown like the South American birds; the under tail coverts have whitish tips, and the white wing lining is of large extent. All the preceding specimens, from off Tristan d'Acunha in the South Atlantic, from Lord Howe Island, and from off Chili, South America, are in agreement, with little variation.

Yet from Lord Howe Island there are three distinct and constant variations, and it would be unwise with our present knowledge to dismiss them as of no value. Thus, to refer to *Fregetornis royanus*: this is uniformly dark coloured, with no white tips, no white lining to the wing, and no white upper tail coverts even. This may later prove a melanistic evolution, but at present the only status that can be considered is a specific one. No melanism is known in this group save one or two specific cases, and it may be that this breeds true, or it may simply be a variation. All the specimens seen agree in detail, and there is not the slightest basis for suggesting that the coloration varies with moult. The matter becomes more complicated when the other species I named are examined. *Fregetornis insularis* has no white tips to the feathers of the back or wing coverts or under tail coverts, but has a restricted white wing lining and

the sides of the body with the feathers streaked down the centre with brown. *Fregettornis alisteri* has no white tips to the feathers on the back or wing coverts or under tail coverts; the inner wing lining shows little white, but the dark colouring of the throat extends on to the breast and the sides of the body, and the feathers of the abdomen and lower sides of the body have dark fringes, but no streaking. The white upper tail coverts have dark tips, but the white is usually not obscured.

Since these were distinguished I have received other specimens of this form which certainly negative any idea of moult changes. The first one agrees best with the preceding in having no white tips to the feathers of the back or wing coverts or undertail coverts, though it is in fresh plumage, and was secured about the same time as the freshest whitest tipped *grallaria* above noted. The white rump has dark tips to the feathers so as almost, but not quite, to obscure it. The sides of the body have the feathers barred, the axillaries are barred, and the wing lining has the white feathers barred. No one, at present, would admit the absolute identity of this with *grallaria*, and it has been shown to most of the authorities at this end.

The next bird agrees closely in detail, having no white tips to the feathers of the back; the wing coverts or the under tail coverts; the white rump is nearly obscured by the dark tips, and the feathers of the side of the body are darkish. *This is a young bird, that had not flown, with a large patch of down adhering to the back of the head and downy tips to the upper tail coverts.* In view of this specimen which is almost a replica of the preceding one, no ornithologist of repute would dare to lump the species, nor would he advocate moult changes. Loomis unwisely "explained" every variation he did not understand as due to moult, dichromatism, or some other vague cause, but this will never lead to the elucidation of the interesting problems seen in this Order of birds. Thus I have here shown that there is a constant bird occurring throughout the Southern Oceans, and at Lord Howe Island, alone in the world as yet known, three or four puzzling variations occur. These may be simply variations, as Messrs. Kinghorn and Cayley conclude; but the evidence at present does not *prove* that. The variations so far seen are definitely three in number, and until much more material is examined, it would be folly to dismiss the names as synonyms. As Loomis states that the moults are irregular, etc., it is not much use pointing out that these birds, which show such different plumages, were secured about the same months and in the same state of plumage. Though I was inclined to consider the white tipping to the feathers of the back as evidence of fresh plumage only, this is not correct, as in *grallaria* they persist until the fresh plumage appears again, with broader tips; they apparently wear off the wing coverts and under tail coverts. In *Fregetta*

(*melanogaster*, *leucogaster*, and *tropica*) the feathers of the back have slight white fringes in fresh plumage which rapidly wear off.

In all the specimens of *Fregettornis royanus*, *alisteri*, or *insularis*, nestling to adult, at any time of the year, no white fringes have been seen.

Messrs. Kinghorn and Cayley's conclusions as to *Fregetta tropica*, *melanogaster* and *leucogaster* are in confirmation of mine, so nothing need be added. As to *F. tubulata*, nothing can be added until more specimens are secured, as these workers have not seen the specimen, and that is necessary in the present group. The nasal tube is undoubtedly softer and more liable to collapse in the Lord Howe *Fregettornis* than in the *Fregetta*, and this softness does not depend on age.

The important items are:—

Fregettornis grallarius, *segethi*, *innominatus* all show white fringes to the feathers of the back at every state of plumage, more prominent in the freshest plumage; all have a white lower surface from the upper breast unmarked and all have well marked white upper tail coverts and extensive white wing lining. Specimens have been examined from South Atlantic, South America West Coast, and Lord Howe Island.

Fregettornis royanus.—Uniform dark, only from Lord Howe Island; may be a melanistic development, but not yet proven.

Fregettornis alisteri and *insularis*.—From Lord Howe Island only. No white tips to the feathers of the back at any stage of plumage or at any time of year; in *alisteri* white upper tail coverts with black tips obscuring white patch; sides of body barred and black of throat extending on to breast; in *insularis* sides of body streaked and upper tail coverts clear white.

These should be retained at present and more research undertaken.

Note by Authors.—Through the courtesy of the Editor, we have been enabled to peruse the proof sheets of Mr. Mathews' "Remarks on Storm Petrels," which is largely a rather involved criticism of our paper on the Storm Petrels *Fregetta* and *Fregettornis*. We have to thank the author for providing further information relating to specimens which were not available to us, but we are unable to see that this affects our earlier conclusions. Lengthy argument is unlikely to add anything save much unnecessary printing, and we feel confident that the statements in our paper will bear close investigation. We therefore merely record our gratification at the interest shown by Mr. Mathews in our work, and express the belief that further material will convince him and others of the validity of our conclusions.—J. R. Kinghorn and Neville Cayley, Ms.R.A.O.U., Sydney.

Palæarctic Ornithologists and Australian Birds

By GREGORY M. MATHEWS, F.R.S., Ed.

Foulis Court, Fair Oaks, Hant.

Some Palæarctic Ornithologists appear to think that Australia is a small island, and being ignorant of its geography sometimes publish misleading conclusions regarding the avifauna of Australia. It is possible that in the future, through the exposure of such ignorance, good work done by palæarctic workers will be depreciated. Such has already been done in the case of Ogilvie-Grant by Tom Carter. Stresemann's geography of his Australian Crows provides another instance, and I have remarked upon a third.

Meinertzhagen, a student of the school of Messrs. Hartert, Naumann and Stresemann, super-splitter in connection with palæarctic forms, has recently published in *The Ibis* a "Review of the genus *Oriolus*." He has included "the sombre-coloured group *Mimeta*," noting: "I cannot see any grounds for keeping them separate, except that they lack the brilliant coloration of the adults of true *Oriolus*." There is apparently, then, no necessity to study the variation, but much can be written about mutation and environment without much reason. Meinertzhagen has admitted: "In the *Mimeta* group environmental differences are the rule"; and then dismisses that factor as applied to Australian birds. Meinertzhagen has allowed

"*Oriolus sagittatus sagittatus* (Latham)—distribution, New South Wales, Queensland, and Victoria;

"*Oriolus sagittatus affinis* (Gould)—distribution, Northern Territory and North-western Australia; and

"*Oriolus flavocinctus flavocinctus* (King) — distribution, Queensland, Northern Territory, and North-western Australia.

It will be noted that all the Australian sub-species save Gould's are lumped, though the writer admits that the differences can be seen, but adds: "I do not consider such differences warrant separation." He then allows *Oriolus flavocinctus mulleri*, as "the yellow tips to the outer rectrices are smaller," a feature which, in my opinion, certainly does not entitle them to separation if the other characters do not. As a matter of fact, the variation in the yellow tips is quite an inconstant feature, and cannot be relied upon, but the point I wish to emphasise is this: *O. f. mulleri* occurs on Roma Island in the South-west Islands, and *O. f. migrator* is admitted from Letti and Moa, two of the South-west Islands, a group of islets so insignificant that Meinertzhagen is compelled to state their locality "immediately east of Timor." That is, having lumped all the Yellow Orioles ranging over Northern Australia, Meinertzhagen agrees that two sub-species can be found on a small group of islands that is almost unmarked on the map. As a matter of fact, the differences observed by Meinertzhagen in the series of Australian birds examined by him

are more pronounced than the ones used by him for separating the island forms; but Roma is an island, and—so is Australia!!

The numerous forms established from these smaller islands are based on small series, collected at the same time and showing the same plumages, contrasted with similar small series collected at different times of the year on other small islands. Their value is generally problematical, whereas the variation seen in Australian birds, when studied by Australians, may lead to valuable results.

The peculiarity of this treatment may be gauged by the fact that Meinertzhagen is not a lumpner when he receives a bird from a new locality, as recently he described as new a form of *Cisticola*, based upon four birds, in moult!

I have recently attended a meeting of British Ornithologists, deliberating upon the status of a sub-species, and over an hour was employed in the examination of series, the only difference being size, and the measurements overlapping. Moreover, it was acknowledged that winter forms might be inseparable under any conditions. Yet the same workers who will thus carefully consider a Palæarctic form, dismiss with airy nonchalance an Australian form, because Australia is an island! Consequently, in the future, Australian workers must accumulate material, until they can study all the forms themselves. It is necessary to have good series; a few specimens each year soon mount up, and would make their study more profitable. Even the best collections available on this side show series only of limited extent, and often of few dates. It is quite useless to attempt to do constructive work with a few specimens; it simply means later revision by someone who will naturally find much disagreement.

Exporting the Wagtail.—It is interesting to learn that an attempt is to be made to acclimatise the familiar Australian Wagtail (Black and White Fantail) in Hawaii. After pointing out that the majority of Australian birds perform friendly offices for the man on the land, which are not always fully appreciated, Mr. J. McKerihan (Mackay) says that, according to the Honolulu correspondent of the *Louisiana Planter*, it is proposed to introduce to Hawaii a number of Australian Wagtails for the purpose of combating the horn fly, which for many years has proved itself a pest in those islands. "The Territorial Board of Agriculture and Forestry," the correspondent writes, "has approved of the introduction into the territory, from Australia, of a small black and white bird known as the Willie Wagtail, whose principal article of diet is the horse fly. The experiment station of the Hawaiian Sugar Planters' Association will be requested to co-operate by having Mr. C. E. Pemberton, one of its entomologists, who is now in Australia, bring the first shipment of birds to the islands. It is proposed to bring 50 pairs, some to be released at once, and the others to be kept in captivity for a time for breeding purposes.—Brisbane *Daily Mail*.

NATIONAL MUSEUM MELBOURNE



The Grey Thrush (*Colluricincla harmonica*)

Photo. by D. F. F. Thomson, R.A.O.U., Canterbury, Vic.

Notes on the Harmonious Shrike-Thrush (*Colluricincla harmonica*)

By DONALD F. F. THOMSON, R.A.O.U., Canterbury, Vic.

There are probably few creatures so altogether charming as the Harmonious Shrike-Thrush (*Colluricincla harmonica*). Not only has it won its way into the heart of all bush folk by the wonder of its soft mellifluous notes, its shy coyness, and its confiding disposition, but it is one of the most economically valuable of all our birds, destroying, as it does, great quantities of insects—especially the larvae of wood-boring lepidoptera and beetles.

Though it is said to be a stationary species, the Harmonious Thrush appears to lead a somewhat nomadic existence, and actually wanders great distances at certain seasons of the year. It is fairly common, and well distributed, and is especially abundant in timbered and hilly country. Though frequently met with in the mountains, it is not at all partial to the denser gullies, preferring the more open forest.

The Grey Thrush is of a more or less solitary disposition, and appears to mate for life, as it is almost invariably met with in pairs, or in little family groups, when the young have just left the nest and are still with their parents.

There is some irregularity as to the breeding months of the Grey Thrush, some of the birds nesting as early as the month of August, or even earlier, and rearing at least two broods in the season. Others, again, do not appear to breed until well into October, when some of the earlier broods are already on the wing.

In the choice of a nesting site, the Grey Thrush shows a greater degree of impartiality than almost any other bird. A hollow tree, a ledge on the face of a cliff, a dense bush, or even the deserted nest of some other bird, are all equally acceptable.

The nest, which is open and cup-shaped in form, varies very much in composition. Sometimes it is a very model of neatness, and is concealed in a cranny with the greatest of cunning; at others, it is merely a loose, untidy mass conspicuous by its very bulk and untidiness. Often it is outwardly composed of long strips of bark, woven together and lined with finer bark and grass. Feathers or any other such lining are not used. On one occasion I observed a nest which was built partly with mud and lined with finer materials. This nest, found near Montrose, Victoria, in the spring of 1922, was placed in a rather unusual situation—about three or four feet high in tall, coarse "cutting grass" in a swampy locality.

Similar nests recorded by Mr. Robert Hall from the Box Hill district were put down by him as old nests of the Song Thrush

(*Turdus musicus*—acclimatised). Mr. A. J. Campbell supports that explanation. However, during a residence of many months in the Montrose district, and in observations extending over several years, I have no record of having observed a single English Thrush, though the Blackbird (*Turdus merula*—acclimatised) is moderately abundant.

Although from the *situation* the nest might have been that of a Blackbird, it was quite unlike the nest of that bird, and resembled in size, general composition and appearance the nest of the Grey Thrush. Moreover, knowing the locality very well, I do not think that a Blackbird has nested there during the previous season. *It would thus appear that the Harmonious Shrike-Thrush does itself sometimes use mud in the construction of its nest.*

Though so tame and confiding, both in the bush and at the farmhouse door, where it has won its way to the heart of so many bush-women by its trustfulness, at the nest the Grey Thrush is very shy. The accompanying photograph is one of a series obtained after much labour, several long waits and many disappointments.

In addition to the rich flute-like notes, the Harmonious Thrush has an exceedingly harsh, grating cry with which it scolds trespassers in the neighbourhood of its nest or young.

When brooding, the Thrush sits fairly tightly, but when the nest is well hidden from view, the sitting bird frequently discloses its position by its curiosity, craning its neck to see the intruders.

As is the case with many immature birds, the young of the Harmonious Shrike-Thrush has not the dove-grey colour of the adult, but shows quite distinctive striations on the breast. Unlike many birds, such as the Magpie (*Gymnorhina hypoleuca*) the young of the Grey Thrush do not remain long with their parents, but are soon left to fend for themselves, whilst the parents seek a new nesting site and busy themselves with the cares of another brood.

Golf Balls in a Crow's Nest.—At Charlton, on the Avoca River, in Victoria, many golf balls mysteriously disappeared. Members after close investigation were at a loss to explain the annoying phenomenon. Recently a member, not thinking about golf balls, visited a Crow's nest about 20 feet high in a buloke tree on the bank of the river, about half a mile from the links. On disturbing the bird, he climbed the tree, and found fifteen golf balls in the nest. Apparently the Crow had been sitting on the golf balls since last nesting season.—Adapted from the *Charlton Tribune*.

Notes on the Proper Protection of the Mutton Bird Rookery at Cape Woolamai

By F. LEWIS, R.A.O.U., Acting Chief Inspector, Fisheries and Game Department, Melbourne.

The sooty Short-tailed Petrel (*Puffinus tenuirostris*), commonly known as the Mutton Bird, is a valuable and interesting member of our native fauna, and the matter of its proper protection is important. The principal rookeries of this bird are situated on Phillip Island, and have been raided, so far as I can ascertain, for the last 50 years, by residents of the island and district in search of the eggs and the young birds. Whether such raiding has resulted in a decreased number of birds coming to the rookeries has been a matter for argument for several years. Personally, I am not prepared to assert dogmatically at the present time that the birds are becoming seriously less in number. I propose, however, to submit in the following notes the evidence which the Department has on the question. I shall indicate the direction in which I think it points, and the best course to be followed in the circumstances. Mutton Birds on Phillip Island have five serious enemies to contend with:—

1. The Fox, fairly recently introduced to the island.
2. Domestic Cats gone wild, and Rabbits.
3. Cattle and Stock on the rookeries.
4. Shifting sand drifts.
5. Man.

Re 1.—THE FOX.

This animal was introduced to the island some years ago, and is now increasing very rapidly. There is a great deal of cover on the island, and with such a plentiful supply of food as Mutton Birds for about eight months in the year, and also plenty of rabbits, it is no wonder that his numbers are increasing. The fox destroys not only the young birds, but also the old birds on their first arrival on the rookeries. Over 100 dead birds were seen on one small rookery this last season, and the destruction of this number would probably affect the breeding of 100 pairs, as it is not likely that, if one of the pair were destroyed by the foxes, the remaining bird would carry on unaided the work of hatching and the feeding of the young one right through the season. The trouble is that the majority of the residents of the island are extremely apathetic regarding the foxes, and very little action is taken to destroy them.

Re 2.—CATS AND RABBITS.

Cats have been liberated in fair numbers on the Cape Woolamai rookery, and will probably account for a fair number of the birds, especially if they are allowed to increase. The rabbits on the Cape are also increasing, more especially of late years.

Re 3.—CATTLE AND STOCK.

Most of the rookeries are to a large extent on private land, and carry a certain number of stock. These animals, in moving about, break in and destroy burrows, loosen the soil, and thus start sand drifts. The Cape Woolamai rookery was also burnt last December, probably to supply grass for the stock. Dr. H. H. Montgomery, who had a large experience amongst the Tasmanian Islands some years ago, states that several of these islands were deserted by the Mutton Birds, because of the damage caused to the burrows by stock. This last season there were on Cape Woolamai a number of cattle, horses, sheep and goats.

Re 4.—SHIFTING SAND DRIFTS.

These play great havoc with the rookeries. One large rookery on the Reserve has been completely wiped out by a big sand drift. Where there are at present large sand hills between Newhaven and the Cape at one time was an enormous Mutton Bird rookery. The action of the cattle and also the burrowing of the rabbits no doubt caused many of these sand drifts to start, and, once started, it is no easy matter to stop them. At the present time there are several small places on the Cape which may develop into bad sand drifts if not dealt with in the near future.

Re 5.—MAN.

Before 1917 the Fisheries and Game Department had no official control over the Mutton Birding and Egging. In that year an Amending Game Act gave power to make regulations, and regulations were made limiting the egging to 15 days, *i.e.*, from the 20th November to the 5th December. Night work on the rookeries was abolished, egging being allowed only between 4 a.m. and 7 p.m. Working at night amongst the burrows not only broke and damaged the holes, but also interfered with the laying habits of the birds. The kind of crook to be used was prescribed, a fee of 2/6 charged for a licence, and the opening of burrows prohibited. The season for taking the young birds was limited to three and a half weeks, from the 15th April to the 8th May, and a fee of 10/- was charged for a licence. Since that date the regulations have been gradually tightened up, the egging season being reduced by three days in 1918. Five o'clock was fixed as the starting hour for egging, instead of 4 o'clock. The birding season has been reduced by 9 days, and the fee for

egging increased to 5/- for the season, or 2/6 per day. Since the regulations came into force most activity has been shown in the egging part of the business. On the average about 250 licences to take eggs and 100 to take young birds are issued every year. It is estimated that about 100,000 eggs and from ten to twenty-five thousand young birds are taken from Phillip Island every year. In view of the above figures, great interest centres around the question as to whether the Mutton Bird lays again after its egg has been taken. The residents of Phillip Island, up till a year or two ago, unanimously believed that the bird does lay again if it is robbed of its egg. Many ornithologists, however, were of the opinion that only one egg in the season was laid, and in Tasmania the authorities accept this position and prohibit the egging altogether. Investigations to test this question have been made by the Department on a small rookery, where burrows have been marked and bands put on the legs of certain birds. Some very interesting results have been secured as a result of this work. In the first place it has been demonstrated that the same pair of birds has returned to the same burrow the year after they had been marked. In other cases only one marked bird has returned, with a strange mate. Up to the present we have not been able to find any evidence that the bird lays a second egg, but the investigations have not been carried far enough to warrant the definite statement.

As to whether the flights of the birds are decreasing, opinions differ very considerably. Men with forty years' experience of the rookeries deny that there is any difference in the numbers of the birds coming in. Dr. Montgomery, already referred to, after long experience, stated that in his opinion there was then no difference from the numbers coming in many years before. Messrs. A. J. and A. G. Campbell, in 1913, conducted an investigation of the Cape Woolamai rookery, and reported that it was, in their opinion, in a very depleted condition. Mr. J. Gabriel, in 1912, stated that in his opinion, if the egging and birding were properly regulated, they would cause no harm, and in his opinion drastic closures of rookeries were not justified.

In conversation with old and experienced men, one statement is made by everyone, that seems to be an accepted fact, namely, that the big flights of the birds are now several days later than they were several years ago. At one time good quantities of eggs were secured by the 20th November, but now it seems to be the universal experience that no number of eggs can be got until the 25th of that month. The eggers explain this by saying that the birds are coming in three or four days later than they used to. It is extremely unlikely, however, that the birds, after coming to these rookeries for perhaps hundreds of years, are now changing their habits, and in my opinion the explanation of this later flight

is to be found in the decreased numbers of the birds coming in. On the other hand, it is a fact that what is known as the Little Rookery on Cape Woolamai is being considerably extended of late years, and is now one of the largest rookeries on the Cape.

Summarised, the position can be stated as follows:—There is very little definite evidence available as to whether the birds are decreasing in numbers or not. It is definitely proved that in some instances they do return to the same burrows a second year. It is probable that only one egg in the season is laid. It is agreed by all with any knowledge of the facts that the principal flights of the birds are now about four days later than they used to be, and in my opinion this latter fact seems to point to decreased numbers of the birds.

The conclusions to be drawn from the evidence available seem to forecast the ultimate doom and disappearance of the smaller rookeries on Phillip Island. In addition to the human element is added the destructive fox and the sand drifts, which are going to cause very serious depletion of this place in the next few years. There is some little danger on the Cape Woolamai rookery, but this danger is not serious at present. Cape Woolamai contains about 400 acres, of which about 320 are privately owned. The land is poor land, not worth, in the opinion of those best able to judge, more than 10/- an acre. At the present time it is used for grazing stock of various kinds, and a very big proportion of it is completely overrun with bracken fern. In view of the possible deterioration and ultimate disappearance of the smaller rookeries on Phillip Island, I suggest that attention should be concentrated on Cape Woolamai, as an ideal site for the protection and conservation of Mutton Birds. If this site could be resumed by the Crown, and all leases of Crown Reserves on it cancelled, it would result in an ideal Mutton Bird Reserve being created. It would be an everlasting attraction of great interest to large numbers of people. The stock, barbed wire fences, etc., would be removed. The pests, such as the cats, rabbits, and foxes could be effectively kept down, the reserve properly fenced, and the regulation of eggging and birding attended to properly, which is very difficult while the greater part of the rookery is privately owned. The Tasmanian Government has seen fit to resume several islands, which had been disposed of previously, in the interests of the Mutton Bird industry, and these islands are now protected and conserved. There are National Parks in the Mallee and in Gippsland, and it appears to me that Cape Woolamai is an ideal site for a National Reserve for the protection of the Mutton Birds. If this suggestion could be carried out, it would result in the efficient protection of these interesting birds on Phillip Island for all time.

Notes on Birds seen on a recent trip up the Diamantina River near the Queensland Border

By G. AISTON, R.A.O.U., Mungeranie, *via* Marree, C.A.

I left Mungeranie on January 9th for a trip up the Diamantina River. The weather was extremely hot at the time, 118 in the shade on the day that I left Mungeranie, and I think it got hotter as I got farther north. I camped the first night at Kirrawadna Creek, and was interested in watching a number of Blue Wrens (White-winged Superb-Warblers) that were nesting near where I had made my camp. Although it was after sundown when I arrived, they were still busy seeking food, and kept on till some time after dark. On the next day at Mirra Mitta I saw dozens of the Australian Dotterel—these were wading about in the shallow waters of the bore stream. There were very few birds on the stream, but I think the hot weather had driven them to somewhere where they could get shade. This night I camped at Kinnenbar Creek. The saltbush and cane grass here was full of the nests of the Orange-fronted Chat. There must have been hundreds of nests, every one that I looked into had young in it. These birds were getting water from a number of shallow holes in the creek bed.

Very few birds were seen after this until I got to Andrewilla, on the Eleanor River, but even here the numbers were nothing to what they would be in the cooler weather. I saw a few Galahs and Corellas, perhaps a dozen Yellow-billed Spoonbills, one Royal Spoonbill, and about a dozen Channel-bill Cuckoos. These latter were evidently fighting with some crows for their nests, as they made a lot of squabbling. A blackfellow who accompanied me on the trip reckoned that they were trying to tell us there was a flood coming, but he observed: "I don't know what they make so much row about; perhaps they forget when the flood come."

Many Boobook Owls were heard at night at this camp, and a few Pelicans were seen, all single birds.

I did not see many birds at Clifton Hills, but noticed one new to me. This was a cormorant of some sort. It swam very low in the water, and dived at the slightest movement that I made. It had a buff-coloured neck and head, and I think a darker stripe down the back of the neck; but I could not get a good look at it. It was close to the camp for two days, but I could not frighten it out of the water to get a look at its body. A few Diamond Doves were seen here, and numerous Crows.

I camped at Andrewilla on my return trip, and found that about twenty Mountain Ducks had come to the water during my absence. At Goyder's Lagoon I saw a few Australian Pratincoles, and a few Australian Dotterels. At this place a

wild dog (dingo) got up from under the shade of a rock and calmly walked across in front of my horses, not five yards in front of my saddle horse. It then waited until I had passed, and then went back to its scrape under the rock. It was miserably poor, and covered with mange.

At Mount Gason on the following morning two Black-backed Magpies landed in the verandah of the house, where we were sitting. They were so exhausted that they had barely strength to flutter up on to a table out of the way of the dogs. After a rest one of them fluttered into an open doorway, but the other stayed on the table. We put some water down for it, but it seemed too far gone to drink. It stayed there all the morning. It was blowing a sandstorm on this morning. I left Mount Gason after dinner, and made for Kinnenbar, where I expected to find water still, but on arrival there I found all the claypans had been filled up with the sand. I had plenty of water for my own use, but had none for the horses. After tea I was lying on my swag idly smoking and watching the embers of the fire, when an Australian Dotterel walked right up to within two feet of me. It went right round the fire and over to the canteen, where some water had been spilt. It scratched around for a little while, when it was joined by another. I got up to put out some water for them, and startled a turkey that was only about ten yards away. It was just within the glow of the fire. In the morning I had a look at the nests of the Orange-fronted Chats, and found many young birds that would not be able to fly for some time. I wondered whether these would die or whether the old birds could fly the fifteen miles to the nearest water, and so keep them alive. Travelling along on this morning an Orange-fronted Chat flew on to the neck of one of the pack horses, and hung on to its mane for a couple of hundred yards. It was very nearly exhausted; its beak was open, and one could nearly hear its panting. It fell off the pack horse and laid on the ground until we were about twenty yards away, when it fluttered after us again, and this time it settled on the neck of my riding horse. It was too weak to get a good grip, but it travelled along for some distance, half holding, half fluttering. I managed to get it in to within about three hundred yards of the water, when it left me. Coming along I saw a Kite Hawk drop dead; it was flying to cross over in front of me about twenty yards up in the air, and about fifty yards in front, when it collapsed and dropped like a stone. It was lying on its back, quite dead, when I passed.

The heat was terrible on this day. It was just as much as one could stand, and the horses were simply wet with sweat, which was dripping off them. It came on to blow another dust-storm in the afternoon, which, I am afraid, would settle all the baby chats at Kinnenbar.

A Bell-Miner Colony

By H. WOLSTENHOLME, Wahroonga, N.S.W., and
J. SUTTON, Ms.R.A.O.U., Mitcham, S.A.

Two lengthy visits were made to a large colony of Bell-Miners (*Manorhina melanophrys*) that dwelt in a coastal gully at Avoca—a seaside resort just north of Broken Bay.

The famous bell notes were heard chiming in the distance, and rang more and more clearly as we drew near, until the sweet musical rings "Tank - - - tink - - - tink - - -" at short and irregular intervals were echoing ceaselessly about us from the tall eucalyptus trees round the gully. Sometimes a bird would "tink" near the ground and close at hand, but this one, rather annoyingly, always seemed to be a ventriloquist, and could not be easily located with the eye. Each bird (tossing the bill upwards and opening wide the mandibles) gives its own separate "tink," or is it "tank"? It gives only the one note at a time. Whether at rest for a little while on a bough or on the move among leaves, or even busy preening its feathers, whatever the bird may be doing, it seems never to forget to contribute its own individual note to the general chorus. So all day long these "silver-voiced bellbirds" keep on their tinkling; just from pure "joie de vivre" apparently, but providing at the same time some of the sweetest bird music to be heard by human ears.

When the birds come into sight, the bright yellow colour of the legs and of the bill—hefty legs and a stout bill—is the first thing noticed, and then the green colour of the plumage. At close enough range this is seen to be of a bright shade on the upper parts, a dull brown green on the wings, and a lighter tint of green on the lower parts. Noticeable, too, is a small patch of red behind the eye. Points of similarity to their relatives, the Noisy Miners (*Myzantha garrula*) are soon recognised. The yellow bill of the Bell-Miner, the conspicuous yellow patch of bare skin about the eyes, and the small black marking on the forehead, combine to give it a facial appearance that is suggestive of its larger and more noisy relative.

Some habits and notes, too, are alike. Fluttering about in the branches or hanging by their strong feet amongst thick leafage, as they play or squabble, a few together after the manner of Noisy Miners, the Bellbirds will reproduce (perhaps not so loudly) the noisy birds' well-known unmelodious squawking notes. And both species have the same curious habit of moving along a horizontal bough towards another bird of the same species with head lowered and bill pointed at the other bird.

No other birds of any kind were seen in the trees, but in the undergrowth and about the ground there were Whip-birds (*Psophodes olivaceus*), White-browed Scrub-Wrens (*Sericornis frontalis*), and beautiful Yellow-throated Scrub-Wrens (*S. lathamii*).

Crows and Ravens

By J. NEIL, McGILP, R.A.O.U., King's Park, Adelaide.

In reference to my article on "Birds of Lake Frome District," in the April part of vol. xxii. of *The Emu*, *Corvus ceciliae*, Aust. Crow . . . "down smoky grey." The quoted words refer to young birds in nest, and not to the down on adult birds. I tried to be as brief as possible, and fear I have rather overdone it, and it may tend to confuse readers. I have not separated Crows and Ravens, but have given Bennett's Crow as a separate species.

My reason for not separating Crows and Ravens is that I can find no consistent difference between them, and as their habits are similar, I am rather inclined to think them the same species, or maybe of sub-specific rank.

The eyes of all Crows, including Bennett's Crow, are at birth a bluish colour, which in a few days changes to a light brown or hazel, and the adults have white eyes—so that we cannot separate the Crow from the Raven in this way. The down of nestlings of Crow, Raven, and Bennett's Crow is dusky or smoky grey. Adult birds of Bennett's Crow have pure white bases to all the feathers on body. I have handled so-called Ravens with lanceolate plumes or heckles on throat, with white bases to all feathers on body, also have handled adult so-called Crows without heckles, with dusky bases to feathers of the hind neck and back; in fact, I'm so much confused that I cannot make certain of more than the two species, Bennett's Crow and Crows (which include Ravens).

In Bennett's Crow the first moult evidently brings up the white-based feathers, for I have never seen a breeding bird with grey bases to feathers. In the rest of the Crows breeding birds are frequently found with grey bases to feathers.

Years ago I was responsible for the slaughter of thousands of Crows, but now that I have seen the error of my ways, and know their value, I do not care to destroy them to make the extensive examination necessary to determine if we really have two Crows besides Bennett's small variety.

Can any of your readers help by giving their observations in *The Emu*? Do the so-called Ravens and other crows inter-breed? How old is the supposed Raven before he attains the heckles on the neck?

Is it not possible for our Zoological Gardens to decide this question for us? Male and female of so-called Ravens could be mated and their progeny carefully observed and results recorded; the same could be done with the so-called Australian Crows. Bennett's Crows could also be mated with the other Crows. It is an interesting study and should prove if we really have three distinct species of *Corvidæ* in Australia.

Private Collections, Etc.—A Rejoinder

By EDWIN ASHBY, F.L.S., C.F.A.O.U., Wittunga,
Blackwood, S.A.

The R.A.O.U. Council has decided, owing to the limitations of space, that the discussion opened by my paper on the above subject at the Adelaide Congress, and published in the January number of *The Emu*, closes with my reply to letters in the April issue. I regret that those who agree in the main with my paper (and, judging by the communications that have reached me, they seem to be many) should not also be allowed to take part in the discussion. It is obvious that the opportunity for these to enter the discussion did not occur until some attempt had been made to controvert the opinions and facts set forth therein. I am sure that all will sympathise with the Editor and Council, in the necessity of restricting matter.

It had been my intention not to reply to the criticisms in the last *Emu*, but under the circumstances it seems necessary for me to do so. First I shall quote from some of the comments that have reached me from members. One says: "Unless a man handles skins of birds, he will not learn a great deal about them, and I regret I have not done more skinning and examining of skins."

Another writes: "An ornithologist must be a collector, or he must work on collections made by others. . . . The 'non-collecting ornithologist' approves of the museum collections (the reservoir, as it were), but he would dam the streams of private collections, which flow into it."

"It is a historic fact that the science of Ornithology has been built up by the collector, the cabinet worker and the systematist, not by the 'non-collecting ornithologist,' and the sentimentalist, who are merely patrons of the science. In demonstration of this I will instance that venerable institution, the British Museum. Its nucleus, or foundation, was the private collection of Sir Hans Sloane, then followed the additions of the Bullock and Montague, etc., collections."

"The immortal John Gould presented many rare specimens; B. H. Hodgson, of India, gave over 22,000 specimens; Dr. Alfred Wallace donated nearly 30,000 specimens, many new to science; Allan Hume, C.B., donated over 59,000 birds and 15,000 eggs; the Marquis Tweeddale (per his nephew, Col. Ramsay), Dr. Bowdler Sharpe, Eugene W. Oates, Dr. F. Ducane Godman, O. Salwin, all gave handsomely. Henry Seebohm, of iron manufacturing fame, donated 16,000 skins and skeletons, besides eggs; W. R. Saunders gave over 10,000 specimens, not to mention the names of 800 or 900 other private collectors, the history of whose gifts is contained in the 'History of the Collections' contained

in the Nat. His. Dept. of the Brit. Mus., pp. 295 to 515. One of our colonial citizens, the late Mr. A. J. North, made a donation of Australian Bird's Eggs. His biography occupies two pages, 432-4, in the same History. In this democratic country presidents usually represent the people. Record has it that all (eleven) of the past presidents of the R.A.O.U. were or had been collectors.

One of my correspondents closes with a reference to several important matters raised in my paper, in which Mr. Chisholm (I am glad to say) shows himself in agreement. Amongst these is my statement: "Lulled by a false issue (that our protective legislation protects) the real factor that counts is largely ignored, *viz.*, the provision of suitable breeding places and the protection of breeding haunts, is the only thing that really counts.' Chisholm writes: 'I agree with the setting apart of sanctuaries.'" My own comment is that my suggestion goes very much further than the providing of isolated bird sanctuaries.

Having now quoted from some of my correspondents, it remains for me to state that I recognise the truth that the men who made the collections in public institutions were almost entirely private collectors. Mr. Chisholm is not against the taking of bird life, but he wants it to be confined to those who do it for monetary consideration. Does not Mr. Chisholm yet know, that the best service is not to be bought? There is not a better evidence of this willing service to their fellows, than the accumulated private collections, now in the British Museum, as cited by one of my correspondents.

Mr. Chisholm's hypothetical picture commencing in second par., p. 312, may be good writing, but it is not a fact; it is not a true picture as far as I am concerned. My example as well as precept has always been, that bird life is so wonderful, and in that sense so valuable, that every native bird that is found dead, however common, should have its skin preserved, whatever the trouble entailed may be. The clause in my paper, at top of page 214, says: "The only restriction required, if it could be properly enforced, is to insist that every bird killed be made into a skin." This met with approval at the Congress in Adelaide. I ask all our member to think out what the implications are, of such an admission? They will find that it cuts the ground from under the "anti" writers, in the last issue.

I cannot help wondering whether more than one of those who adversely criticise my paper may, in the past, have been a collector, not of the "Belltrees" stamp, which Mr. Chisholm commends as "semi-national," but mere "collectors," with an aptitude for acquisitiveness that might be well satisfied with a collection of stamps. I would remind your readers that the "private collecting" I have advocated, is always of the "semi-national"

THE UNIVERSITY OF MICHIGAN



A Young White-faced Heron (*Notophyx novæ-hollandiæ*).

Photo. by L. G. Chandler, R.A.O.U., Red Cliffs, Vic.



Silver Gulls (*Larus novæ-hollandiæ*) poised and flying above the steamer "Merimbula."

Photo. by A. F. D'Ombra, R.A.O.U., "Hylacola," Gosford, N.S.W.

stamp; and although of necessity, without the financial backing of Mr. H. L. White, but as a partial make-up for that deficiency, a large amount of gratuitous hard work.

I look upon the collecting I advocate as an education to the individual, a contribution to the world's knowledge, and a gift to posterity. I would that our friends had started on such lines, and then surely they would not have written in the strain they have.

I have no desire to prove myself right and others wrong. I seek truth, whether it accords with my view or runs counter to it. I plead for a less parochial outlook, remembering that we are dealing with a more or less vast unpeopled continent.

Camera Craft

The White-faced Heron.—In December, 1921, I had information that at Baxter, Vic., there was a nest of the White-faced Heron (*Notophox nova-hollandiæ*) containing young. In the hope of securing a photograph of the nest and young, and the adults at the nest, I visited the locality. The nest was situated about twenty feet from the ground, and while I examined the surrounding trees for a position suitable for work with the camera, the young herons—four in number—stood in characteristic, semi-rigid positions, in an attempt to escape observation. Suddenly they took fright, and three birds flew strongly over the tree-tops and away. The fourth hesitated for a minute, and then followed. I noticed that its flight was weak, so I started in pursuit. I shook it out of a sapling, in which it had settled, and after a chase it was captured. Placing the bird on a stump, where, after a few lunges with its beak at the camera, it settled itself quite placidly, I took several photographs. During the proceedings the "subject" disgorged five specimens of the yabbie, or fresh-water crayfish, and an examination of the ground below the nest showed that this was a favoured article of diet. The Heron is undoubtedly a valuable bird to the man on the land.—L. G. CHANDLER, R.A.O.U., Red Cliffs, Vic.

* * *

Interesting Silver Gulls.—This photograph was taken on board the s.s. *Merimbula*, off Montague Island (South Coast, N.S.W.). As soon as the boat is near the island, the birds, Silver Gulls (*Larus nova-hollandiæ*), fly out, and are fed by the captain. They can catch meat as easily as any Magpie, and not one scrap that was thrown out ever reached the water. There were several hundred birds off the Island, and quite a few of them follow the *Merimbula* to Eden, and back to the Island the next day,

where they leave her. I am told they nest on the Island, and wait for the *Merimbula* each week. Photos taken with a Graflex at 9 a.m., one-thousandth part of a second. Unfortunately the sun was against the lens.—ATHOL D'OMBRAIN, R.A.O.U.

* * *

A Queer Nesting-Site.—Here is a queer nesting-site of the small Buff-tailed Thornbill (*Geobasileus reguloides*). An old methylated spirit can, evidently thrown out from a hut near by, had caught by the handle in a small shrub, and after some time had rusted half away. The birds built in it, laid three eggs, and brought out the brood. A few days after the young birds left the nest, a severe storm blew down the nest.—ATHOL F. D'OMBRAIN, R.A.O.U.

Stray Feathers

The Coot in Tasmania.—During the past six years or thereabouts, there has been a remarkable increase in the numbers of the common Coot (*Fulica atra*), which frequents the lakes and watercourses of our island. During mid-April of the present year I had a trip on the Derwent River as far up as boats usually run, and noted hundreds of the birds all the way along, wading and swimming; some were in small parties, others in a score or two together, and so little disturbed were they by the presence of the boat, that they manifested no alarm—simply moved a little further away, and went on feeding. Anglers who go trouting to the lakes of the Tasmanian midlands report great numbers there also, and attribute it to the increase of the “water-grass” at the bottom of the shallower parts, the Coots apparently using this weed as food. Parties have recently made their appearance on the Mersey River, N.W. Tasmania, and have a pretty effect, floating *en masse* in mid-stream. While the beautiful Swamp-Hen (*Porphyrio melanotus*, Temm.) and the Native Hen (*Tribonyx mortieri*, Du Bus) seem just about to hold their own, the black Coot steadily increases, although all three appear to feed upon the “water-grass” common in the shallower parts of our lakes and streams.—H. STUART DOVE, W. Dept., Tas., 15/6/23.

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Spine-tailed Swifts in Tasmania.—The first Spine-tailed Swift (*Chatura caudacuta*) of the season was seen at 6.30 p.m. on 18th January, 1923, about an hour before sunset, going at a great rate towards north-west, at a moderate height. Wind was fresh south-westerly; frequent showers, sky mostly overcast.



A Strange Nesting Place of the Buff-tailed Thornbill

Photo. by A. F. D'Ombrian, R.A.O.U., Gosford, N.S.W

THE END OF THE WORLD

On the evening of 21st January, a fairly large party of Swifts was overhead from about 7 o'clock until nearly dark; they came from south-east and went north-west, then returned and circled at various heights, from about 150 ft. to 300 ft., and higher, evidently feeding. The white chin and whitish rump showed very distinctly during their evolutions. There had been light showers during the day, and heavy cloud was in evidence during the evening hours; wind south-east, fresh, most of the day.

The next party was not sighted until 31st March, when a large number went over in the evening on migration, from south-east to north-west, at a height of 200-300 ft., going direct, not feeding. They looked very beautiful with the light of the evening sun blazing upon the plumage of the underside. In singles and small parties they were passing from 5 o'clock until close on 6; weather was fine, with a south-west breeze; but the previous day had been stormy, with wind veering from north-west to south-west. This was the final party of the summer.—H. STUART DOVE, F.Z.S., W. Dvpt., Tas.

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Pacific Heron and Hawk.—On a lagoon at Moorook, S.A., on a fine bright day, in September, 1922, water birds were numerous. Pelicans, Cormorants, and Ducks were on the water, and Spoonbills, Herons, and many other birds were on the shore. Close to me a Pacific Heron (*Notophoxyx pacifica*) was standing just in the water when my attention was drawn to a Hawk soaring in great circles in the sky. Suddenly the Hawk swooped down at a fish floating on the water, and the many birds scattered in alarm. The Hawk, however, missed its prey. The Pacific Heron with a flight like that of an arrow, seized the fish just as the Hawk on a quick return swept back, but he was too late. The Hawk did not attempt to take the fish from the Heron, but continued its search for food. The whole scene was interesting, and lingers in the memory.—SAML. SANDERS, R.A.O.U., Warra-dale, S.A.

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Colour Changes in Pacific Herons.—Four White-necked Herons (*Notophoxyx pacifica*) taken from the nest in 1916, and kept in Taronga Park since, have shown some interesting colour changes in the spotting of the neck and striping of the breast. When they arrived the neck showed profuse spotting, as will be seen in *The Emu*, vol. xvii., p. 57. In 1919 this marking had been considerably reduced. In 1921 the marking has gone completely in three birds and just shows as a single line down the centre of the neck in one bird; the striping of the breast is also much less conspicuous. In the spring the neck is washed with pale cinnamon, but becomes whiter about January. In captivity these birds are adept fly-catchers, taking all flying insects attracted by their food.—A. S. LE SOUEF, C.M.Z.S., Taronga Park.

Bird Notes from Bega.—About October last I had an opportunity of observing at fairly close range a company of Sharp-tailed Stints, or Sandpipers, which had congregated on a mud-pool of about an acre in extent, left by a flood beside a main road near Bega, South-east Coast of New South Wales. The birds would not then, I think, have long arrived from their breeding-grounds in Northern Asia.

At first only ten Sandpipers appeared, but by degrees the number increased, until about one hundred of the grey-brown birds were feeding at the pool. Others, no doubt, passing in the night, heard the calls of those feeding at the mud-pool, and descended to join them. After they had fed, the birds packed together in companies, and remained thus for hours, almost without movement. One of the Sandpipers was picked up dead at some distance from the pool, near an elevated bridge. It had probably either been struck by a hawk or had flown into the railings of the bridge during the night.

Several Brown Hawks sat on fences near the mud-pool, but made no attempt to interfere with the Sandpipers. These Hawks, I think, rarely or never injure other birds. I have observed a Magpie-Lark calmly perched on the same tree and within two feet of one of these sluggish birds. On one occasion, however, a Hawk attempted to rob an Egret of a small eel, but was easily repulsed. The Sandpipers remained at the pool about three weeks, and then disappeared in the night. I had previously seen odd couples and small companies feeding at pools about salt lakes on the South Coast, but never before so close to a town. On a damp flat near the mud-pool and about its margins a company of about forty Straw-necked Ibis solemnly fed, and I afterwards saw about twenty of these clerically-attired birds dozing in the sunshine on a large gum-tree. Immediately on formation of this mud-pool, and while it still held a fair depth of water, twenty Little Grebes mysteriously appeared upon it, accompanied by Silver Gulls, Cormorants (three varieties), and White-faced Herons, while numerous Black-fronted Dotterels ran nimbly along the margin, picking up worms and aquatic insects, and a White-necked Heron paid a short visit. Just recently I saw a single Leaden Flycatcher, which is rare in this quarter. Neither this bird nor the Rufous Fantail seem to nest in the South Coast scrubs. I have often had the latter bird under close observation for hours during the breeding season, but could never discover a nest, while the Flycatcher above-mentioned usually occurs singly. The Black-faced Flycatcher I have seen once only in this district.—H. V. EDWARDS, R.A.O.U., Bega, New South Wales.

The Morning Dip at the Seaside.—As an annual summer visitor to the Tweed Heads districts I have always been interested in the honey-eating birds that are plentiful there at that time. They are the Scaly-breasted Parrakeet (*Trichoglossus chlorolepidotus*), the Brush Wattle Bird (*Anthochaera chrysoptera*), and the Leatherhead (*Philemon corniculatus*). They frequent the Banksias that are everywhere along this part of the coast, from which they reap a rich harvest. It is noteworthy that whilst the Parrakeets and Leatherheads keep almost entirely to the *Banksia serrata*, the Brush Wattle Birds rarely visit that tree, but are usually found in the *Banksia integrifolia*, even though both trees are indiscriminately mixed with one another, and with other vegetation. This year at Bilinga, on the Tweed Heads line, a party of Brush Wattle Birds had discovered a house at which the guttering along the front verandah sloped the wrong way, and therefore held a little store of water from the last rain. A company of 20 or more were lined along its edge alternately hopping into the water and out again, and thoroughly enjoying their morning dip. This is the first time I have seen these birds alight anywhere but in a tree, and a fact that adds further interest is that the house was occupied.

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The Moulting of the Blue Wren.—I was much interested in Mr. Dove's fine notes on the Moulting of the Blue Wren (*Malurus cyaneus*), (*vide Emu*, vol. xxii., pp. 323, 324). Like Mr. Dove, I had been puzzled as to the date of moulting, and had decided to take dates in reference to a pair of Wrens that inhabit my garden, but alas, my resolution was not carried out to satisfaction, as I had to be absent from home for numerous lengthy occasions, and the actual date of the first sign of the moulting has been lost. For information I am sending on a few notes.

October 29.—A pair began carrying nesting material to a hedge in the garden; nest observed, probably half built.

November 14.—Inspected nest; 3 eggs.

November 30.—Young birds heard in nest; both birds carrying insects to young.

December 10.—Young out of nest, just able to fly short distance; fed by both parents.

February 1.—Male in full plumage, female and 3 young in grey plumage in garden.

February 13.—Male bird still in full plumage, and family in garden.

February 14 to April 12.—Absent from home—no notes taken.

April 15.—Five Wrens in grey plumage in garden.

April 29.—Only two birds in grey plumage in garden; considered to be the old pair from actions, etc.; both birds quiet, and seen frequently on lawn and open spaces.

May 27.—Male bird showing dead black on back and round collar, tail feathers blue. Have not been able to find male bird for over a week, but female constantly about. When found the male was hard to view, as he kept to hedges and creepers, as if ashamed of his dress (which is shabby), quite a contrast to his usual habit, when in full plumage, as both are very quiet and trusting; only the pair in garden.

June 1.—To-day male showing more markings of a dark blue or black collar, especially on neck and collar, showing himself a little more, but still hanging about in shrubs, creepers, and dense bushes.

June 4.—The male bird is now very much brighter in plumage.

June 7.—After observing male bird daily, I view for first time distinct appearance of pale blue on forehead.

June 8.—Pale blue now showing at ear coverts.

June 14.—Have observed male every day, and have been astounded at the rapidity of the change in plumage. To-day I consider that he has his "superb" coat on, that is, he has fully developed his full plumage. He is now as "show-off" as ever, and feeds with his mate almost at one's feet.—J. NEIL MCGILP, R.A.O.U., King's Park, S.A.

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Gould's "North-west Coast of Australia."—Gould described many birds from the North-west Coast of Australia collected by Gilbert and also by the Officers of surveying vessels.

It became necessary to determine what this meant, but after much research, exactitude was not found possible. I therefore arbitrarily selected "Derby, North-west Australia," in many cases. Witmer Stone, upon examination of the Gouldian collection under his care, found that many specimens so localised were labelled Port Essington, and I accepted this and altered my selection accordingly. Recently Mr. A. J. Campbell, F.A.O.U., recording collection made on account of H. L. White, of Bell-trees, queried in some cases this latter determination.

In Gould's time, and by extra-limital workers even to-day, Port Essington was sometimes referred to as being in the North-West of Australia, as the following passages show.

In his Handbook, vol. 1, p. 419, 1865, Gould has written: "A specimen is contained in the collection formed by Mr. Bynoe at Port Essington." P. 428: "Bynoe . . . procured it on the banks of the Victoria River." On p. 410: "This species was one of several collected by the officers of H.M.S.S. *Beagle*, and for the specimens from which my descriptions were taken I am indebted to Messrs. Bynoe and Dring. The bird has also been brought to England by Sir George Grey. All these specimens were collected on the North-West coast, and it is not infrequently seen on the Cobourg Peninsula"; while on p. 423: "This beautiful and

well-marked species of Grass Finch is a native of the North-West coast of Australia, where several specimens were shot by Gilbert during an excursion from Port Essington toward the interior of the country."

These instances conclusively prove that under the name "North West Coast of Australia," Gould at least sometimes included Port Essington.—GREGORY M. MATHEWS, F.R.S.E.

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Members will regret to learn of the death of Mr. E. J. Banfield, R.A.O.U., the "Beachcomber," on his "Tropic Isle."—Dunk Island, and also Mr. J. E. Chubb, R.A.O.U., of the National Museum, Melbourne, formerly curator of the skin collections of the R.A.O.U. A more extended notice will appear in our next issue.

State Secretary's Report

TASMANIA.

The Tasmanian members of the R.A.O.U. are looking forward to the Annual Congress which is to be held in Hobart next November. The Trustees of the Tasmanian Museum and the Council of the Royal Society have kindly agreed to assist in every way possible in order to make the meeting a success.

The Royal Society's Lecture Hall and the rooms at the Museum will be available for the Conference. It has been arranged that members will leave Melbourne on Friday, November 2nd, in which case they will arrive at Hobart on Saturday evening. As the first Monday in November is a public holiday in Tasmania, the actual official work of the Conference will not commence until the Tuesday morning, but for the first two days that the delegates are in Hobart arrangements will be made for them to visit places of interest in the vicinity of the capital, where they will be able to carry out a certain amount of field work concerning the birds of the locality.

At the conclusion of the Conference it is proposed to hold a camp out at Adventure Bay, situated some thirty odd miles south of Hobart. In this locality members will be able not only to study the avifauna of the forest, but also the sea birds of the southern coasts. The large Penguin rookery in the near vicinity will also add additional interest.

In order to have the arrangements as complete as possible, the State Secretary for Tasmania (Mr. Clive Lord, Director of the Tasmanian Museum, Hobart) would be glad if members who propose to attend the conference would advise him as soon as possible of their intention and details concerning hotel accommodation and other matters will be forwarded.

CLIVE LORD, F.L.S., Hobart.

Correspondence

THE EXPORT OF LIVE AUSTRALIAN BIRDS.

The Editor of *The Emu*.

Sir,—As a member of a good many years' standing (almost since the commencement, in fact) of the R.A.O.U., I view with some apprehension one of the resolutions carried at the recent congress of that body, held at Adelaide: "That no export of Australian birds be allowed for profit."

May I be allowed to state the case as it appears to me, an ornithologist in the Old Country who has always taken a great interest in the avifauna of Australia? Years ago, mostly through studying Gould's works, I became interested in Australian birds. Their dried skins did not satisfy me, but only made me the more anxious to study their habits in life, the result being that eventually I kept in my aviary, a miniature Australian "bush," many species, and was able to study their breeding habits. Amongst those that bred there may be mentioned *Psephotus multicolor*, *P. haenatonotus*, *Euphema bourkei*, *Coturnix pectoralis*, *Synoiacus*, *P. acuticauda*, *Phaps chalcoptera*, *P. elegans*, *Chalcophaps chrysochlora*, *Ocyphaps lophotes*, *Turnix varia*, and several others.

By this means I learnt much more of the habits of these birds than any books could teach me. I was able, for instance, to study more closely than it had ever before been studied, the courting of the male *Turnix* by the female, and the incubation, hatching and rearing of the chicks by the *male*, all of which is recorded in the pages of the *Avicultural Magazine*.

My friend, the late Mr. Reginald Phillipps, was able to record his careful observations on the nesting in his London garden of the Regent Bird and the Blue Wren, while another English aviculturist, bred the Satin Bower-Bird and was able to put on record the fact of this species breeding while still in immature (green) plumage.

The Avicultural Society, with its Journal, the *Avicultural Magazine*, has always aimed at scientific aviculture; the keeping of birds under conditions as nearly as possible approaching those of nature, and the recording of their habits, and the records published of the habits of Australian birds, during its life of nearly thirty years has, I venture to say, added something at least to our knowledge of these.

It would seem that the new regulations will put a stop to the keeping of Australian birds in England, and thus to the study over here of this intensely interesting avifauna. In my present position as an official of a scientific society, I might perhaps obtain a permit to export certain species for the society I represent; but in practice scientific societies, like private individuals, except in special cases, have to rely upon the man who "imports

for profit," for their supplies of foreign birds, and in future, as these supplies are to be stopped, the collections of the various Zoological Societies of Europe and America will have to be stocked with birds from Africa, India and South America. No longer will the visitor be cheered by the voice of the Kookaburra or the Magpie, which reminds the Australian visitor of his home in the bush, or the Englishman who has, like the present writer, visited the Antipodes on some never-to-be-forgotten expedition.

There are many private scientific aviculturists in Great Britain who keep their birds under the best possible conditions. Supposing these are able to obtain permits, how are they to get their birds home? Are they to trust them to the tender mercies of some ship's butcher? The thing is impracticable, and unless some professional collector is allowed to export, which he will only do "for profit," none will be exported. Surely if you licensed one or two reliable collectors who were known to be honest and to treat their birds well, and if the Resolution 2: "That no export of any bird in danger of extinction be permitted," were rigorously enforced, no harm could result.—Yours, etc.,

D. SETH-SMITH, M.B.O.U.,

Curator of Birds, Zoological Society of London.

[Export under proper conditions after inspection, through recognised scientific bodies, for scientific and educational purposes, is provided for. This it is felt will amply meet the needs of our esteemed member, Mr. Seth-Smith, and his enthusiastic co-workers who have added much to scientific knowledge of Australian birds.—Eds.]

Notes

EXPORT OF AUSTRALIAN ANIMALS.

Recently a deputation from the National Parks Section of the Town-Planning Association of Victoria waited on the Minister for Customs (Hon. Austin Chapman).

On the lines of the resolutions carried at the R.A.O.U. Congress in Adelaide last October, the deputation asked—

- (a) That import of any foreign animal into Australia be prohibited pending investigation and recommendation by an advisory committee;
- (b) That export of native animals for private profit be prohibited;
- (c) That export of native animals for scientific and educational purposes be permitted only after inspection, and through recognised zoological societies;
- (d) That a committee to advise the Customs Department be formed in each State of the Commonwealth; and

- (c) That strict inspection of collections formed by scientific expeditions be made to ensure the carrying out of the Prime Minister's decision that type specimens must be lodged in an Australian Museum, and duplicates of rare animals collected must be presented to the Museum of the State in which they were collected.

The Minister, in reply, declared his interest in, and sympathy with, the wishes of the deputation. He promised investigation, inspection and a considerable tightening up. He also invited the deputation to make suggestions as to the personnel of the advisory committee.

The National Parks section, acting on the lines proposed at the R.A.O.U. Congress last year, has suggested a committee of seven, with a substitute delegate for each, so that a quick decision can be reached. The representatives suggested are:—

1. Representing University and learned societies, *e.g.*, Royal Society: Sir Baldwin Spencer and Professor Agar.
2. Museum: Messrs. J. A. Kershaw and G. F. Hill.
3. Zoological Society: Messrs. A. H. Wilkie and A. Currie.
4. Field Naturalists' Club and Natural History Societies: Mr. F. G. A. Barnard and Dr. G. Horne.
5. Wild Life Preservation Societies and Society for Prevention of Cruelty to Animals: Messrs. A. Latham and J. L. Menzies.
6. Nat. Parks Section: Messrs. W. F. Gates and R. H. Croll.
7. The R.A.O.U.: Dr. J. A. Leach and A. J. Campbell.

It is expected that an advisory committee will be appointed in each State.

* * *

RETENTION OF TYPES IN AUSTRALIA.

One of the resolutions adopted by the Congress of the Royal Australasian Ornithologists Union in October, 1921, related to the desirability of retaining the types of any new species of birds collected in Australia.

The extension of the principle to all classes of Australian Fauna has since been advocated, both in the press, and by learned Societies. It is therefore gratifying to know that the Prime Minister of the Commonwealth has intimated that in future scientific collectors will be required to deposit the types of new species collected in an Australian museum, and that specimens of any rare species collected (already named) are likewise to be so deposited. An expedition of British scientists is now operating under these conditions.

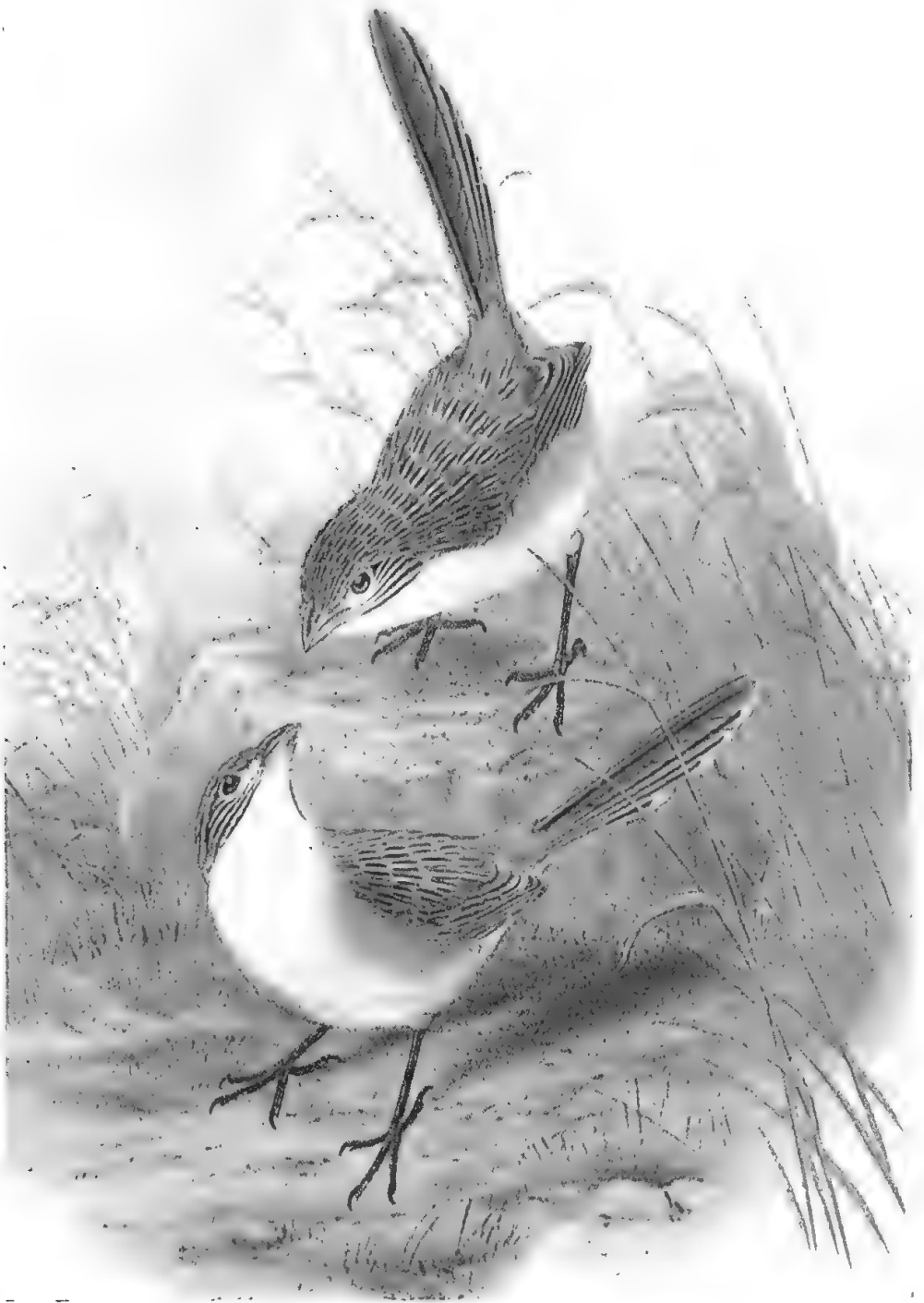
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On account of financial stringency causing a change of printers, *all* standing matter had to be used in the present part. This has necessitated the holding over of important articles, reviews of ornithological works, correspondence, obituaries, and other matter.

* * *

The date of publication of this part was Wednesday, July 4th, 1923

NATIONAL MUSEUM MELBOURNE



THE LONG-LOST EYREAN GRASS-WREN

The Emu

Official Organ of the Royal Australasian Ornithologists' Union

"Birds of a Feather."

VOL. XXIII.]

1ST OCTOBER, 1923.

[PART 2.]

The Long-Lost Eyrean Grass Wren

By A. J. CAMPBELL, C.M.B.O.U., F.A.O.U.

The history of this real *rara avis*—the Eyrean Grass-Wren (*Amytornis goyderi*)—is as unique as it is brief. There are no examples extant, other than two in the British Museum. These were collected by F. W. Andrews, one of the members of the Lake Eyre Exploring Expedition, and were forwarded to Gould in 1875 by F. Waterhouse, then director of The South Australian Museum.

The Eyrean Grass-Wren was supposed, like others of its peculiar genus, to frequent the so-called "spinifex," or porcupine grass (*Triodia irritans*) country of the great interior. As in the case of the Night-Parrot (*Geopsittacus*), it is difficult to conjecture the exact cause of disappearance of the Grass-Wren. Possibly the domestic cat gone wild has been largely responsible. However, if the rare bird still exists in parts, the Council of the R.A.O.U. hopes the accompanying reproduction of Gould-Sharpe's fine plate (*Birds of New Guinea*, Vol. III., p. 8), may assist explorers, or other observers, to identify the species and report it, should it be met with.

Stejneger (Stand. Nat. His. (Kingsley), Vol. IV., pp. 499 and 462), in 1885, altered two Australian bird's names—*Amytis* to *Amytornis* and *Atrichia* to *Atrichornis*. Almost all workers, including Sharpe, accepted the change on nomenclatural grounds. Some nomenclators, however, would force still another name for *Amytornis*, because a "nude name." That excuse can hardly apply, seeing that Stejneger wrote:—"Wren-like birds of brown plumage, with curious white longitudinal streaks"—an apt description of the genus. Even Mathews states: "Anyone can tell a Grass-Wren because of its streaked appearance" (*Birds of Australia*, Vol. X., p. 166).

The Council is indebted to the courtesy of Mr. J. A. Kershaw, F.E.S., curator National Museum, for the loan of the plate, the six-colored reproduction being by Messrs. Patterson, Shugg Pty. Ltd.

A Week on the Upper Barcoo, Central Queensland

By W. B. ALEXANDER, M.A., C.F.A.O.U., Sherwood,
Brisbane.

Through the kindness of Mr. D. W. Gaukrodger, R.A.O.U., of Alice Downs Station, near Blackall, I was enabled to gain some idea of the ornithology of this interesting region during a week spent with him at Alice Downs, in October, 1922. I trust that on some future occasion Mr. Gaukrodger will find time to write an account for *The Emu* of the birds met with in the district, since a resident in any locality is obviously the proper person to undertake such a work. Nevertheless, first impressions have their value, and since, as far as I am aware, there is no ornithological literature concerning the neighbourhood of Blackall, with Mr. Gaukrodger's permission I am publishing my notes on the birds we saw together.

Blackall is a considerable township situated in latitude 24 deg. S., longitude 145 deg. E., about 350 miles from the nearest point on the coast (Broad Sound, between Rockhampton and Mackay), and about the same distance in the opposite direction from the north-east corner of South Australia. It is served by a railway which runs south from Jericho, a station on the main line from Rockhampton to Longreach, the total distance by rail from Rockhampton being about 360 miles. Alice Downs Station is situated to the north of Blackall, the homestead being about 11 miles from the town.

The creeks which traverse the district unite to form the headwaters of the Barcoo, known in its lower stretches as Cooper's Creek, which flows into Lake Eyre on those rare occasions when it flows anywhere. The main divide is only a few miles to the eastward, and the creeks to the east of the divide flow into the Belyando, which, after junctioning with the Burdekin, flows into the Pacific Ocean between Townsville and Bowen. The divide, in this region, is too low to form any barrier to the distribution of birds, nevertheless, the Blackall district probably forms the easternmost point of the range of several species characteristic of the interior regions. This is due to the fact that in the neighbourhood of Blackall the open forest country, which reaches from the coast to the divide, meets the open grassy downs which stretch from here westwards into the interior.

This fact adds greatly to the interest of the locality to the naturalist, and is doubtless the reason for its richness in bird life. We were able to identify 107 species of birds during the week, which is undoubtedly a very large number for a locality so far inland. Though natural surface water is scarce, the numerous artesian bores and bore-channels enable the birds to obtain water readily, so that we may suppose that they are more plentiful now than they were before the district was settled by man.

At Blackall the bore-drains run into the river, which, as a result, has a permanent flow for several miles, and several aquatic species were met with here which were not seen elsewhere.

Four main types of country may be distinguished, though they are not always sharply defined, viz.:—Open downs, open forest (desert), scrub and river flats. The open downs are somewhat undulating stretches of country, clothed with grass, with a few trees scattered sparsely over them. One of the commonest of these trees is a species of *Bauhinia*, which was flowering at the time of my visit. Its large red flowers were a great attraction to Friarbirds and other honeyeaters. The downs formation is due to carboniferous limestone (rolling downs) rocks which are only covered with a thin layer of soil. This country is fed over by great flocks of sheep, whilst emus, plain turkeys and broilgas are in numbers on it. The open forest country, which is locally known as "desert," is characteristic of sandy soil. Fairly large eucalypts and other trees grow upon it, with an undergrowth of flowering shrubs and a certain amount of coarse grass. Cattle seem to do well on it, but, generally speaking, it is only used as drought relief country for sheep.

Between the downs and the desert lies a belt of scrub of varying width, mainly gidyea, and brigalow. I was surprised to learn from Mr. Gaukrodger that scrub turkeys and wonga pigeons were found in this scrub, as I had supposed that these birds were confined to the coastal districts. An old mound of the former was shown me, but we did not meet with the latter.

Along the creeks, and adjacent to them, large trees of various kinds occur, and in places there is a thick growth of various species of shrubs. These creek belts which I am referring to as river flats, seem to attract the greatest variety of bird life. At the time of my visit, the country was very dry, and there was no flow in any of the creeks, though a certain number of natural waterholes and several artificial dams excavated in the creek beds attracted ducks, herons and other water-fowl.

Hardly any birds were found breeding; evidently they were waiting for rain. A heavy shower occurred one night near the end of my visit, and thereafter several species at once began building.

A detailed list of the species observed with notes thereon is appended.

Dromaius novæ-hollandiæ. Emu. — These fine birds are very plentiful about Alice Downs, frequenting especially the borders of the open downs, where the grassy stretches are mingled with bushes and trees, but they are also numerous among the trees near the creek, and occur in the "desert" country. The breeding season was practically over at the time of my visit, and it seemed that very few broods had been reared this season. A nest containing addled eggs, from which the bird had only deserted the previous day, was shown us by one of the men.

We saw also a brood of about a dozen young running with one of the parents. These had just lost their down, and had acquired their first coat of almost black feathers.

Alectura lathamii. Brush-Turkey. — As mentioned above, an old nesting mound of this species was seen in the scrub, proving its presence in the district. We did not meet with any species of quail, though more than one kind occur at times.

Geopelia humeralis. Bar-shouldered Dove. — Two individuals of this species were seen, one flying through the scrub, the other perched on a log on the ground in rather thick vegetation on the banks of a small watercourse.

Geopelia placida. Peaceful Dove.—Common everywhere.

Ocyphaps lophotes. Crested Pigeon. — These beautiful birds were common, and small parties were seen near most of the dams and pools visited, either perched in some neighbouring tree or running on the ground towards the water for a drink. They seemed to be dispersed through all classes of country. One nest, on which the bird was sitting, was seen in a fairly dense tree about 10 feet from the ground. A pair in a large flight aviary by the house had two young in a nest in an oleander bush. At the time of my arrival they were fully fledged, but only about half the size of their parents, and one or other of the parents was almost always sitting on the nest attempting, with small success, to cover them. When the nest was approached the parent uttered a plaintive coo, sounding like "oo, oo, oo," but made no attempt to move. If one put one's hand near the nest the parent bird struck smart blows at it with its wing. It was quite surprising how well the bird could aim and what a sharp knock it could give with the elbow. The young birds grew rapidly, and a day or two later left the nest and scrambled about the branches of the bush. On the first evening after they left the nest they were on separate branches, and one parent roosted beside each. Next night the two parents roosted together with one young bird on each side.

We did not meet with the Bronzewing, which is fairly common in the district, nor with the Wonga Pigeon, which is said to occur in small numbers in the scrubs. The Flock-Pigeon visits the district in some seasons.

Tribonyx ventralis. Black-tailed Native Hen. — A considerable flock was met with running about the mud amongst the dead trees in a dam which had nearly dried up. They mostly followed one another in a line when running, and the tail, longitudinally compressed and carried vertically, gave them an odd resemblance to bantam hens. At one place a number crossed a narrow stretch of water still keeping in line one behind the other. They ran until the water got too deep, and then swam readily and rapidly across. The tail was still held vertically up when they were swimming. A few rose and flew over the trees, and while flying the tail was carried behind in a normal position. They were not heard to utter any sound.



Three young Emus just hatched, and an Egg chipped.



Crested Pigeon and young in nest.

Photos. by D. W. Gaukrodger, R.A.O.U.

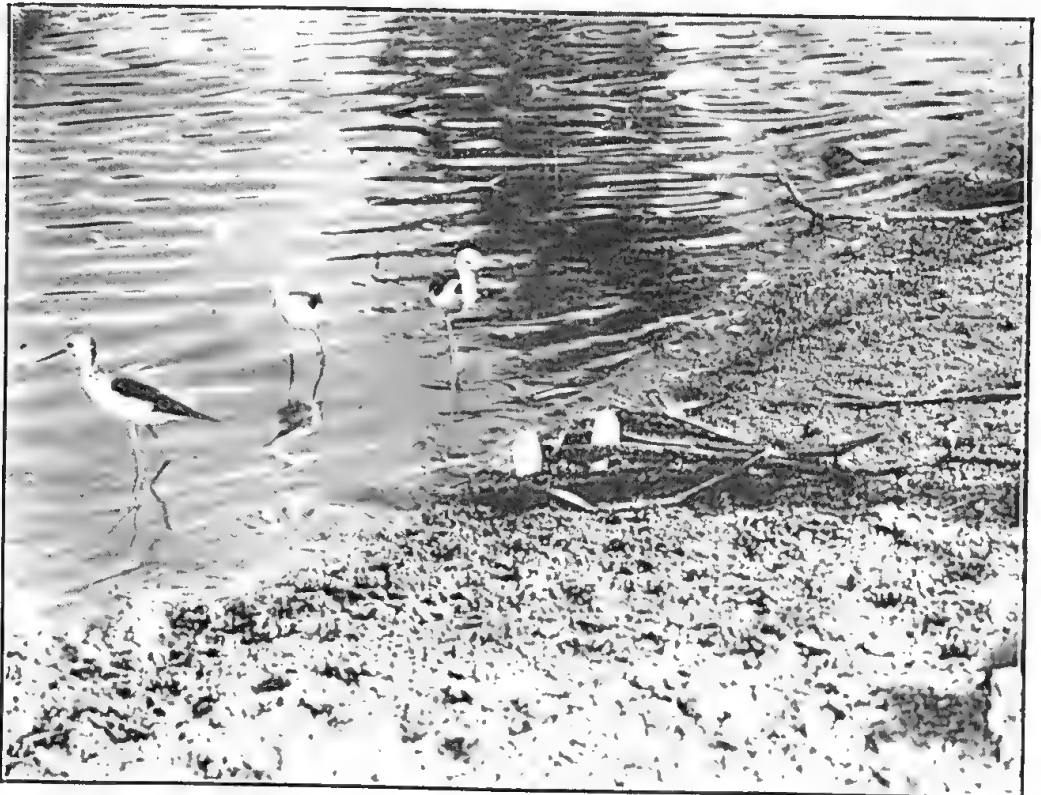
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Sharp-tailed Stints.



White-headed Stilts.

Photos. by D. W. Gaukrodger, R.A.O.U.

Gallinula tenebrosa. Black Moorhen.—A few in full breeding plumage, with bright red bill and frontal plate, were seen on a reed-fringed lagoon on the outskirts of Blackall.

Porphyrio melanotus. Eastern Swamphen.—One was seen on the bank of the lagoon on the outskirts of Blackall.

Podiceps ruficollis. Little Grebe.—Single birds were seen on two of the dams visited.

Chlidonias leucoparcia. Whiskered (Marsh) Tern. — One was seen flying over the lagoons close to Blackall.

Erythrogonyx cinctus. Red-kneed Dotterel. — One was seen on the mud of the dried-up dam mentioned above.

Zonifer tricolor. Banded Plover.—A party of four was seen on open ground close to a dam.

Charadrius melanops. Black-fronted Dotterel.—A few of these birds were feeding on the margin of one of the dams and lagoons visited.

Himantopus leucocephalus. White-headed Stilt. — Four of these stilts were running about the water's edge at one of the dams. Mr. Gaukrodger set up his camera behind a brushwood fence which ran down the bank, and, after a good deal of patience, the birds were ultimately driven within range of it and several photos were secured. The best, in which three of the flock are seen, is reproduced herewith.

Pisobia acuminata. Sharp-tailed Stint. — A flock of four was seen on open country near one of the dams. Subsequently, Mr. Gaukrodger secured an excellent photo of a party of these birds, which is reproduced.

Stiltia isabella. Australian Pratincole. — A single bird was seen on bare open country near one of the dams, and a number of pairs on the bare country surrounding an artesian bore. These beautiful, graceful plovers were new to me, and I watched them for some time with great interest. They run lightly over the ground on their long, slender legs, frequently pausing, and at each halt they appear almost to lose their balance, tilting right back and then oscillating the body several times. When closely approached, they suddenly spread their long wings, disclosing the white rump, and skim round at no great height above the ground, their long legs projecting much beyond their tails. Each pair seemed to have its own territory, and I have little doubt they were nesting, or about to nest, though we failed to discover the eggs. One pair in particular seemed very reluctant to go far when their territory was invaded, and one individual of this pair allowed us to approach it very closely, uttering a squeaky note as if to attract attention. When followed, the bird once or twice stumbled forward with wings half spread, evidently pretending to be injured in order to draw us away from its nest.

Eupodotis australis. Australian Bustard (Plain Turkey). — These fine birds were common, especially on the borders

of the open downs near the homestead. They were scattered about singly, or in pairs, or small parties, the largest flocks containing some 8 or 10 individuals. These larger parties always seemed to be composed of small individuals, larger specimens being solitary or in pairs.

Antigone rubicunda. Brolga. — Native Companions were frequent, especially on the edges of the open downs. They were generally in small flocks up to about 8 individuals. Their trumpeting calls were chiefly heard in the mornings and evenings. After being disturbed, one or more of the party would frequently indulge in curious antics when alighting, dancing about with wings spread. They were frequently seen walking down to the water in the dams, and when drinking took a sip and then raised the head to swallow—like domestic fowls.

Threskiornis spinicollis. Straw-necked Ibis. — Some single birds were seen on two occasions near water.

Platalea regia. Royal Spoonbill. — These were seen on several occasions on dams and waterholes, generally singly, but on one occasion in a small flock.

Platalea flavipes. Yellow-billed Spoonbill.—One of these was seen with the flock of the other species.

Egretta alba. White Egret.—Single birds were seen on two of the lagoons visited.

Notophox nova-hollandia. White-faced Heron. One or two were seen near most of the dams and lagoons.

Notophox pacifica. White-necked Heron. — One or two seen at almost every waterhole.

Nycticorax caledonicus. Nankeen Night-Heron. — What was almost certainly an immature bird of this species was flushed from a tree near a waterhole, but it flew away amongst rather dense trees without giving us a satisfactory view.

Pupetor flavicollis. Black Bittern.—Several were observed in trees along the river bank at Blackall. At night a rather hoarse croak was heard several times in the trees growing along one of the bore-drains near the house. It was probably the note of either this or the preceding species.

Chenonetta jubata. Maned Goose (Wood Duck).—A flock of about 10 was seen on one of the dams.

Anas superciliosa. Grey (Black) Duck.—A few were seen on several of the waterholes visited.

Virago gibberifrons. Grev Teal.—A considerable flock was seen on one waterhole, and a single bird with a flock of Black Ducks on another occasion.

Nyroca australis. Australian White-eyed Duck.—One seen amongst Black Ducks on a waterhole.

Phalacrocorax ater. Little Black Cormorant.—Numerous on the lagoons just outside the township at Blackall.

Microcarbo melanoleucus. Little Pied Cormorant.—Frequent

on the river at Blackall. A few also seen on most of the dams and waterholes visited.

Anhinga nova-hollandia. Australian Darter.—Single birds were seen near dams on two occasions.

Pelecanus conspicillatus. Australian Pelican.—A flock of a dozen was seen flying over the homestead in a line one morning.

Uroaetus audax. Wedge-tailed Eagle.—Only one was seen during the week.

Haliastur sphenurus. Whistling Eagle. — These were common, and a number was generally to be seen round the homestead in company with Black Kites, on the look-out for scraps. Many of their bulky stick nests were seen in large trees growing in the beds of dry watercourses, sometimes in proximity to a dam. Beneath the nests, on the ground, there was generally a large number of sticks, which had been dropped during the construction of the nest. One nest contained a young bird, which, from the ground, appeared to be fully fledged. Beneath this nest was the greater part of the skeleton of a young emu.

Milvus migrans. Black (Fork-tailed) Kite. — Numbers of these birds were always to be seen about the homestead, sailing about in the air, sitting in groups in the trees, or hopping about on the ground in search of scraps. When one secured a treasure, he would fly off with it, pursued by a number of his mates. If close pressed, the first bird would drop the scrap, but one of the others almost always obtained possession of it before it reached the ground, when the chase would begin again.

It was the first time I had met with these birds in Australia, though I had seen the species years ago in the south-west of France. Why is it that this kite is only found in the inland districts, or, at any rate, only visits the coastal regions occasionally? Is it owing to competition with the Whistling Eagle, which seems to take its place in the better watered localities? It can hardly be due to the greater difficulty of discovering carrion in the more thickly-wooded districts, since in other parts of the world it is by no means confined to open country.

At first glance, or at a distance, it is liable to be confused with the Whistling Eagle, but its darker colour and somewhat forked tail easily distinguish it. The great use it makes of its tail when flying is one of its most striking characteristics. When fully spread, the tail appears quite square, but when only partially expanded, it is markedly forked. Not only is it constantly opening and closing the tail, according to the direction of its flight in relation to the wind, but it also commonly tilts it sideways, no doubt to obtain lifting and driving power from the breeze. In this position the appropriateness of calling the toy kite after these birds is specially manifest.

Falco subniger. Black Falcon. — One of the men employed on the station told us that there was a "brown hawk's

nest" in the hollow spout of a tree close to which he had been camped for some time, and the parents had been feeding young. Guided by him, we approached the tree, and soon noticed a very dark hawk, with whitish marks on the cheeks, sitting in a fork. It allowed us to approach very close before it flew; then it mounted rapidly in the air, till it reached a good height, and for some time continued to sail round above in circles, not moving the wings, and with the long tail spread very wide at the tip. The breast was somewhat lighter than the rest of the plumage, and there can be no doubt it was a Black Falcon. Meanwhile, our guide climbed to the spout, but it was empty, though he said there were some sticks in it. There appears to be no record of this species nesting in a spout, and though it seems probable that the bird seen was the one that had nested there, the evidence is not conclusive.

Ieracidea berigora. Brown Hawk.—Single birds were seen on several occasions; frequently they were disturbed when settled on the ground. All those seen were of the dark form.

Cerchneis cenchroides. Nankeen Kestrel.—Common, especially on the open downs, where they were constantly to be seen hovering.

Ninox boobook. Boobook Owl. — One was seen in the daytime sitting in the mouth of a large spout some way up a tree. When approached it retreated into the spout out of sight. Some hours later it was in the mouth of the hole again, but this time flew out and entered a hole on the other side of the tree, where it disappeared.

Cacatua galerita. White Cockatoo.—Single birds were seen on several occasions in the desert country and river flats. Their loud, harsh screams drew attention to them.

Cacatua roseicapilla. Galah.—Plentiful, especially on some of the open downs, where considerable flocks were constantly seen feeding on the ground. Mr. Gaukrodger pointed out numerous trees near the homestead in the hollows of which they had nested. As usual, the bark round the entrance of the holes had been bitten off by the birds.

Leptolophus hollandicus. Quarrion (Cockatiel). — Small parties were seen flying on several occasions. They are readily recognised by their very long tails and the white patch on the wings. Only on one occasion were they seen settled. Their notes are much more melodious than those of most parrots.

Aprosmictus erythropterus. Red-wing Parrot. — Plentiful in the large trees on the river flats. Considerable parties were commonly seen together, most of the birds being in immature plumage. In the middle of the day they seem to sit quietly in the trees, and, in spite of their size, they are difficult to see.

Platycercus adscitus. Pale-headed Rosella. — A few were seen in the open forest country. The Ring-neck or Bullen-Bullen (*Barnadius barnardi*) also occurs in the district, but we did not

meet with it. Nor did we come across the Tawny Frogmouth (*Podargus strigoides*) or the Owlet-Nightjar (*AEgotheles cristata*), both of which Mr. Gaukrodger has found nesting on the station.

Eurystomus orientalis. Broad-billed Roller (Dollar-bird).—A bird of this species was seen in a large tree growing on the bank of a dry creek.

Dacelo gigas. Laughing Kookaburra. — Kookaburras were seen on a few occasions, but were not common.

Halcyon pyrrhopygius. Red-backed Kingfisher. — One was seen in a small tree on the open downs. It was the first Mr. Gaukrodger had met with in the district.

Halcyon sanctus. Sacred Kingfisher.—Fairly common in the trees along the watercourses.

Merops ornatus. Rainbow-bird (Bee-eater). — Common, especially in the sandy desert country. They were frequently seen at waterholes drinking or bathing. Flying over the water at a low elevation, they suddenly check their flight and plunge into the water with a splash, reappearing almost instantly, to fly up to a neighbouring tree.

Cuculus pallidus. Pallid Cuckoo. — Single birds were heard calling, and were seen on a few occasions. In February, 1923, a male Koel (*Eudynamys orientalis*) was found wounded near Alice Downs, and Mr. Gaukrodger kindly sent it to me for identification, as he had not met with the species in the district before. Presumably it was migrating north for the winter when it met with the accident that disabled it. The Channelbill (*Scythrops novae-hollandiae*) occurs in the district at times, but had not arrived at the time of my visit.

Hylochelidon ariel. Fairy Martin. — Martins were seen in small numbers hawking over the water at most of the dams visited. I failed to satisfy myself as to which species they belonged, but Mr. Gaukrodger told me that Fairy Martins formerly nested about the homestead, as well as in one or two other localities on the station, so there is little doubt that it was this species which we saw.

Microeca fascinans. Jacky Winter. — Very common everywhere, and constantly heard singing. One was seen sitting on a frail nest in the fork of a small branch of a dead tree growing on the edge of a swamp.

Petroica goodenovii. Red-capped Robin. — Fairly common in the open forest country.

Melanodryas cucullata. Hooded Robin. — Fairly common, One male was seen several times near the same spot not far from the homestead. On one occasion (uttering a harsh, scolding note) he was seen to fly savagely at another bird and chase it away.

Rhipidura leucophrys. Black and White Fantail.—The Willie Wagtail was common everywhere.

Seisura inquieta. Restless Flycatcher (Grinder). — Frequent. A pair had almost completed a nest in a lemon tree in a garden in Blackall. One of them was constantly sitting in it, though it did not contain any eggs.

Oreoica gutturalis. Crested Bellbird. — A pair of these birds were seen hopping about on the ground amongst shrubs growing near a creek. When disturbed they flew up into adjacent trees. They were not heard to utter any note.

Pachycephala rufiventris. Rufous-breasted Whistler.—Common; often heard singing.

Pteropodocys maxima. Ground Cuckoo-Shrike. — Parties of these birds were seen on two occasions, and as I had never met with them previously, I observed their habits with much interest. When feeding on the ground they run about fairly actively, the head bobbing backwards and forwards meanwhile, as in the Magpie-lark. At intervals they rise and flutter for a few yards just above the grass-tufts, and then settle again, a habit which reminds one of the behaviour of the White-shouldered Caterpillar-eater, when it has flocked for the winter, and is feeding on the ground. Once or twice one flew up on to a fence-post, and when it settled shuffled its wings a few times in a fashion similar to that of the species of *Graucalus*, though the satisfactory arrangement of the wings seemed to be accomplished more quickly than in those birds. When travelling, their flight is rather slow, periods of rapid flapping of the wings alternating with periods of gliding with the wings almost closed. They seemed to frequent the edges of the downs where belts of trees occur.

Graucalus nova-hollandia. Black-faced Cuckoo-shrike. — Frequent.

Graucalus robustus. Little Cuckoo-shrike. — One was seen amongst the trees in the valley of a creek. Mr. Gaukrodger had not previously observed this species in the district.

Campephaga tricolor. White-shouldered Caterpillar-eater.—Frequent. The males commonly heard singing.

Pomatostomus temporalis. Grey-crowned Babbler. — Common. Many of their characteristic nests were seen in the trees.

Epthianura tricolor. Crimson Chat. — Common in the open country near the homestead, feeding in parties on the ground, and when disturbed flying up into the bushes. They differed greatly in plumage; from the fully-plumaged males, with their bright crimson caps, breasts and tails, to birds with only a trace of red on the tail. The only note heard was a finch-like twitter.

Acrocephalus australis. Reed Warbler. — In the reeds by a lagoon just outside the township at Blackall these birds were numerous, and were singing beautifully. At Alice Downs one was seen and heard singing in a tree in the homestead garden, and others on two occasions in trees elsewhere, but there was



Young White-faced Herons in nest.



Male Rufous-breasted Whistler at nest.

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none in the reeds in the pool by the Chinaman's garden, where they usually breed, and where Mr. Gaukrodger has obtained a splendid series of pictures of the birds at their nests. I think it is certain that the individuals seen in trees were migrants passing through the district on their way south.

Smicromis brevirostris. Brown Weebill (Tree-tit).—Small parties were seen in the trees on a few occasions.

Gerygone olivacea. Southern Warbler. — A pair of these little birds were met with on two occasions amongst a group of "dead-finish" trees in a paddock near the homestead. The plaintive, quavering song, so familiar to me when I lived in Western Australia, was only uttered occasionally, but it was hearing it in the distance that guided me to the spot frequented by them. The white patch at the sides of the base of the tail, which distinguishes the species, was clearly seen. Knowing that Mr. A. H. Chisholm had met with a species of Fly-eater when he visited Alice Downs, but had not been able to identify it, I was specially anxious to decide the point, and was fortunate in doing so, as only one pair was met with. This record slightly extends the known range of the species in Queensland, the most northerly record hitherto being Tambo, about 60 miles to the south-east.

Acanthiza nana. Little Thornbill. — A numerous party was met with in some saplings hopping about actively, and constantly twittering.

Acanthiza albiventris. Allied Thornbill. — A pair of birds, which I believe were of this species, were seen in company with Yellow-tailed Thornbills, but their actions were very different. They kept to the bushes, only occasionally going on the ground, carried the tail elevated, and hopped actively about uttering a harsh, chattering note resembling that of the Brown Thornbill (*A. pusilla*). The dark rufous rump was very conspicuous.

Geobasileus reguloides. Buff-tailed Thornbill.—Fairly common, generally in small parties in the small trees and bushes scattered over the open downs. A nest of this species, containing three small young, was seen. It was a rather untidy structure, only partially domed, the dome being complete at the back, but with only a strip of material down the middle of the front, leaving two large apertures, one on either side. This nest, besides being of unusual form, was built in a situation uncommon for the species, in the hanging twigs at the end of a branch of a eucalypt about 6ft. from the ground, where it swayed violently with the wind. The parent birds were very tame, and visited the nest whilst we stood within a few feet of it, so there was no doubt about the identification.

Geobasileus chrysorrhous. Yellow-tailed Thornbill.—Small parties were frequently seen, generally feeding on the ground.

Malurus melanotus. Black-backed Wren. — Three pairs of

these beautiful little birds were seen in different localities. In each of these localities Mr. Gaukrodger is accustomed to meet with them during the summer, but a stranger without his guidance might spend a long time on the station without meeting with these birds. The first pair seen were amongst long grass on the border of a dry swamp, where the Purple-backed Wren was also found; the haunts of the other two pairs were amongst bushes, in one case near a creek bed, in the other merely in a hollow. The three males seen seemed to differ considerably from one another in the shade of blue; in the lightest bird there was comparatively little contrast between the colour of the cheeks and that of the rest of the plumage, whilst in the darkest the cheeks were strikingly lighter than the remaining plumage. One male had lost its tail feathers, but did its best by cocking up the stump. The females were readily distinguishable from those of the other species by the lighter blue colour of the tail; one specimen had a slight tinge of blue on the throat.

Malurus assimilis. Purple-backed Wren. — Fairly common, generally seen in small parties, consisting of a male and several females or young. Two pairs were about the homestead garden, generally keeping low, but frequently ascending to some height in a pepperina tree. One pair were building a nest in a hedge about three feet from the ground, but seemed to make little progress during the week. Outside the garden the birds seemed to be almost confined to the river flats.

Artamus leucorhynchus. White-breasted Wood-Swallow. — Plentiful about the township of Blackall, but not seen elsewhere in the district.

Artamus personatus. Masked Wood-Swallow. — A large flock was seen on one occasion only; many perched in the trees, others flew round in the air, some at a great height. The party included young, with the masks very indefinite.

Artamus cinereus. Black-faced Wood-Swallow. — Common, especially near the homestead. On October 25, following a heavy shower of rain during the night, a pair were seen beginning to build a nest in the fork of a dead-finish bush. The foundation consisted of rootlets rather loosely put together. Little progress had been made when the nest was visited the following day.

Artamus minor. Little Wood-Swallow. — Frequent. Seen in pairs scattered about the country. In two cases birds behaved as if nesting, flying into hollows in dead trees. One of these hollows was inspected and contained only some debris. The birds in this instance remained close at hand, and one spread out its wings and let them hang down beside the branch on which it was perched. The pleasant song of this species was heard on several occasions.

Colluricincla harmonica. Grey Shrike-Thrush. — One was

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Left—Spiny-cheeked Honeyeaters at drinking vessel.
Right—Part of a family of Apostle-birds in Nature.

Photos. by D. W. Gaukrodger, R.A.O.U.



Left—Striped Honeyeater at nest.
Upper right—Male Black-backed Wren.

Lower right—Young Pallid Cuckoo being fed by a Singing Honeyeater.

Photos. by D. W. Gaukrodger, R.A.O.U.

heard and seen in some trees close to the river at Blackall.

Grallina cyanoleuca. Magpie-Lark. — Plentiful. Many old nests were seen. In a tree in a garden in Blackall young birds just fledged were being fed by one of the parents on a branch close to the nest, whilst the other parent appeared to be renovating the nest, presumably with a view to another brood.

Struthidea cinerea. Apostle-bird (Grey Jumper).—Common. Parties of from a dozen to thirty or forty were scattered over the district, mostly on the river flats.

Neositta chrysoptera. Orange-winged Sittella (Tree-runner). — Small parties were met with on several occasions. I was a good deal surprised to find this species so far north, as, though all the books I have consulted include Queensland in its range, I have not met with it in the coastal districts, even in the south of the State, its place being taken by the White-headed Tree-runner. Hall's Key gives its range as 2, 3, 4, i.e., up to North Queensland. North, on the other hand, says it ranges north to Southern Queensland. As far as I can ascertain, the present record is the first for Central Queensland, and adds considerably to the known range of the species.

Climacteris picumna. Brown Tree-creeper. — Common in open country.

Climacteris superciliosa. White-browed Tree-creeper. — A single specimen was seen in large timber in the dry bed of a creek.

Dicaeum hirundinaceum. Mistletoe-bird.—Rather common.

Plectorhyncha lanceolata. Striped Honey-eater. — Very numerous, constantly calling and singing; occasionally it sings in the air when flying from one to tree to another.

Stigmatops indistincta. Brown Honey-eater. — A few were seen by a waterhole to which they came to drink. Their song was occasionally heard.

Meliphaga virescens. Singing Honey-eater. — A few were seen.

Meliphaga penicillata. White-plumed Honey-eater.—Plentiful everywhere. Often seen drinking at the edges of waterholes.

Myzantha flavigula. Yellow-throated Miner. — Plentiful everywhere.

Acanthagenys rufogularis. Spiny-checked Honey-eater. — Plentiful. Numbers were feeding on the flowers of the Bauhinia trees. They have a habit of flying up almost perpendicularly out of a bush or small tree, and descending again with the tail partly spread. They utter a great variety of notes, sometimes singing fairly musically, frequently making a series of rather plaintive piping notes.

Entomyzon cyanotis. Blue-faced Honey-eater.—Frequent.

Philemon corniculatus. Noisy Friarbird.—Plentiful; feeding in flowering silky-oaks in the homestead garden and in the Bauhinia trees in the surrounding country.

Philemon citreogularis. Little Friarbird. — Common and noisy.

Anthus australis. Australian Pipit.—Common.

Mirafra horsfieldi. Bush-Lark.—A few seen on the downs.

Zonæginthus guttatus. Diamond Firetail (Spotted-sided Finch).—A single bird was seen on the ground in the bed of a creek near a waterhole, from which it flew up into a tree. Mr. Gaukrodger had never met with this species before.

Tæniopygia castanotis. Zebra (Chestnut-eared) Finch. — Small parties were frequently seen, usually when coming to drink at waterholes. There were generally a good many birds in immature plumage, with a smaller number of adults, in each party.

Steganopleura bichenovii. Banded Finch. — Small parties seen on several occasions, generally when coming to drink at waterholes.

Oriolus sagittatus. Olive-backed Oriole.—A bird was seen at dusk on October 23 in the homestead garden, when it was too dark to identify it certainly. It soon flew into a large fig-tree to roost. It remained in the fig-tree all the next morning, most of the time sitting quietly and warbling softly. Excellent views of it were then obtained, and its identification placed beyond doubt. In the afternoon it disappeared. The species had never previously been seen here by Mr. Gaukrodger.

Chlamydera maculata. Spotted Bowerbird. — These interesting birds were numerous; they were often in the trees about the homestead, and were frequently seen at other places in the neighbourhood. Their common miewing and harsh notes were those generally heard, but occasionally they were heard to mimic the notes of Whistling Eagle, Black Kite, Yellow-throated Miner and Spiny-checked Honey-eater. A very considerable number of their bowers were seen and inspected. They varied a good deal in situation, size and form. Among the ornaments, vertebrae of sheep and bits of green glass were by far the most numerous. Other objects seen at one or more bowers were bits of shells of freshwater mussels, bits of emu egg-shells, curled green wattle-pods, green berries, green young oranges, leaden labels, burnt bones, stones, bits of clear or purplish glass, a bit of a telephone insulator, an aluminium pepper-pot, and a tin ring from a bottle. In general, these objects were more or less promiscuous, but at one bower there was a large pyramidal heap of bones at each end, a smaller pile of stones beside the bones at each end, and pieces of broken glass paving the bower. It is quite evident that green, white or glittering objects are those which specially appeal to the æsthetic sense of this species. In all the bowers I have examined in various districts, I have not yet found a yellow or a red object, and blue objects are uncommon, though bluish stones and purplish bits of glass are sometimes found.

Corvus coronoides. Australian Raven. — Common, especially about the homestead. One was shot and proved to have dusky bases to the feathers and lanceolate plumes on the throat, though its eyes were hazel.

Corcorax melanorhamphus. White-winged Chough. — One party of these birds was seen amongst the trees growing near the margin of a dam.

Cracticus nigrogularis. Pied (Black-throated) Butcher-bird. — Common. An interesting episode was noted on one occasion while we were having our lunch. A young butcher-bird was seen to fly at a grey lizard (*Amphibolurus sp.*); about 2 feet long, on the ground. The lizard drew itself up and opened its mouth wide, disclosing the bright yellow colour inside. The bird stopped short, gazed at the apparition for a moment, and then flew away. The lizard remained in its threatening attitude for some time, then turned round and ran away on its hind legs.

Cracticus torquatus. Grey (Collared) Butcher-bird. — Not nearly so plentiful as its more handsome relative, but seen and heard occasionally.

Gymnorhina tibicen. Black-backed Magpie.—Frequent.

Of the 107 species observed on the Upper Barcoo, no less than 90 occur also in the neighbourhood of Rockhampton, or in the hilly country some 30 miles to the westward of that town, where I lived for over a year. Those which I did not meet with near the coast are the following:—Australian Pratincole, Black-tailed Native-hen, Black Falcon, Black Kite, Galah, Crimson Chat, Crested Bellbird, Ground Cuckoo-shrike, Black-backed Wren, Red-tailed Thornbill, Yellow-tailed Thornbill, Grey Jumper, Orange-winged Tree-runner, White-browed Tree-creeper, Yellow-throated Miner and Australian Raven. Most of these are definitely interior forms, but a few are birds with a southern range, which have apparently held their own inland, though Papuan or Torresian types have displaced them on the coast. The Galah extends towards the coast at least as far as Alpha, on the western side of the Drummond Range, where I saw them from the train. On a subsequent visit to Coomooboolaroo Station, near Duaringa, on the western side of the Dawson River valley, I found that Grey Jumpers were numerous there, and Mr. C. A. Barnard, ex-President, R.A.O.U., informed me that this was the eastern boundary of their range. I also learnt from Mr. Barnard that the range of the Yellow-throated Miner meets that of the Noisy Miner in that locality, though only the latter species was seen there by me.

Mr. Gaukrodger has kindly allowed me to use some of the splendid photographs taken by him in the region with which this paper deals, to illustrate my article. Many of his pictures will appear in Cayley's work on *The Birds of Australia*, shortly to be published by Messrs. Angus and Robertson, of Sydney.

Australian Petrel Forms; Still more to learn

By TOM IREDALE, M.B.O.U., Sydney, N.S.W.

During my voyage from England to Sydney, I attempted to identify the Petrels seen, and devoted the most of my time to this study. I made observations every two or three hours and watched the birds following the ship for periods of from half-an-hour to an hour at a time.

As I had studied this group in the cabinet for the past twelve years and had seen nearly every specimen that had reached the British Museum, the Rothschild Museum, and Mr. Matthews' collection, I hoped to be able to identify the different forms with a fair degree of certainty. As these notes were taken from the stern of the ship, no Prions or Storm-Petrels were seen, so that these troublesome groups did not come into review.

The story really began at Colombo for, soon after leaving the port and, when still within sight of land, a single wholly dark Shearwater was seen flying about. The occurrence of this species was probably due to the monsoon, the bird having lost its way and been driven north. Just before leaving England, I was shown some dark Shearwaters which had been sent for identification from the Colombo Museum. These had been picked up dead on the coast, and proved to be of two species. One was a form of Wedge-tailed Shearwater, which was recognised as *Puffinus pacificus hamiltoni* — the Seychelles breeding bird. This was quite a normal record, but the other species turned out to be the Fleshly-footed Shearwater (*Hemipuffinus carneipes*), which, as far as our knowledge goes at present, must have come from Western Australia. Thus these two species had arrived at Ceylon through rough weather from entirely different directions, and this probably often happens.

Nothing else anything like a Petrel was seen until after we passed the Cocos-Keeling Group, when two Mollymawks, or smaller Albatrosses, were observed in the distance. They were very wild, and never came within about half a mile of the ship, but were seen all day keeping parallel to the ship's course, getting southward again. Many more were seen the next day, but none came near enough to be identified; they appeared in the distance to have darkish heads and bills. A flock of lesser birds with white heads was disturbed, but they did not come near; judging from their flight they might have been White-headed Petrels (*Pterodroma lessoni*). We arrived at Fremantle after dark on July 11, 1923.

During the morning of July 12th, while lying in the Road, an immature Mollymawk came round, but flew away again. As far as could be seen, it had a dusky head and black bill.

A number of Giant Petrels (*Macronectes giganteus*) came round and sat on the water close astern. Then a single Cape Pigeon or Cape Petrel (*Daption capensis*) came, and a solitary Storm-Petrel joined in the crowd at the back of the ship. As far as I could judge, the Storm-Petrel was Wilson's Storm-Petrel (*Oceanites oceanicus*), as it had long legs stretching behind the tail.

At the Perth Museum there is a series of Mollymawks, or smaller Albatrosses, some with dusky heads and black bills, others with white heads and black bills, and others with the full coloured bill of the Yellow-nosed Mollymawk (*Thalassageron chlororhynchus*). This seems to be the common Mollymawk of the west of Western Australia, and probably all the Mollymawks noticed up to now belonged to this species. The bird with a white head and black bill was named *Thalassageron carteri* by Lord Rothschild some years ago, but it is now recognised as a plumage phase of *T. chlororhynchus*. The bill of this species is of a distinctive delicate shape, and can be recognised whatever the plumage condition.

Fremantle was left at 7 p.m., July 13th, 8 a.m. Many Mollymawks were following the ship: some with pale bills, some with black bills, some with black bills with yellow ridge (culmen), but all with pink feet. All the pale-billed birds were the Black-browed Mollymawk (*Thalassarche melanophris*), adults of which have bright orange bills. All the others were yellow-billed Mollymawks in different stages of plumage. On the wing they seemed more delicately formed birds than the Black-browed, with more white under the wing. At 8 a.m. *melanophris* was in the majority, about midday *chlororhynchus* was more common, but at 3 p.m. very few *chlororhynchus* could be detected. The black-bill can be seen in the distance, the exact coloration only when the bird is close to the ship.

At 12 noon the ship's position was 35° 5' S., 116° 18' E., 255 miles from Fremantle. Between 3 and 4 p.m. many Mollymawks, with their heads under their wings, were passed asleep on the sea. The Great-winged Fulmar (*Pterodroma macroptera*) was continually seen in the distance, but it never came round behind the ship; its dark coloration and distinctive flight easily distinguished it.

It should be noted that no Albatrosses (*Diomedea*, strictly speaking) had yet been seen; though I saw a couple of dark birds in the distance, I could not make out, before they were lost to sight, whether they were Giant Petrels or Sooty Albatrosses.

July 14th, 8 a.m.—A few Mollymawks and Sooty Albatrosses were flying in the distance. 9 a.m.—Sooty Albatrosses were fairly common, but not very close to the ship. However all were Sooty Albatrosses of uniform coloration, though

some were lighter in coloration than others. Some came close to the ship, and after patient watching, a pale line could be seen on the bill, thus showing them to be the Sooty Albatross (*Phaebetria fusca*). Mollymawks were mostly *chlororhynchus*, with a few *melanophris*. Great-winged Fulmars were still commonly seen in the distance, while two Cape Pigeons followed the ship, and two Giant Petrels were easily picked out by being darker with shorter broader wings, different flight, and especially by the huge pale-colored bill. One Albatross (*Diomedea*) was noted for the first time; it had a white head and body, only the tips of the tail dark, and the wings all brown save a white patch near the base.

10 a.m.—Three Albatrosses were now present, one of which, though differing little from the preceding, had the tail pure white. This could not be the Wandering (*D. exulans*), nor did it at all look like the Royal (*D. regia*).

11 a.m.—A lovely Snowy Albatross (*D. chionoptera*) came into the scene, all white save tips of wings, and all white under wings save tips of primaries.

12 noon.—Ship's position, $35^{\circ} 23'$ S., $124^{\circ} 16'$ E. Ship's run, 392 miles.

More Albatrosses joined up. After watching them all day, I have concluded they all belong to the Snowy Albatross (*D. chionoptera*), and must have come from a breeding locality somewhere near here, as none was observed the first day out from Fremantle. They have the heavy bill of that species, and all are white-headed. Though in the younger ones the wings are mostly brown, there is always a square olecranal patch of white, and adults are beautiful—nearly all white. Only the very darkest winged birds have the tip of the tail dark. This is the most important observation yet. Mollymawks were only *chlororhynchus* and *melanophris*; the former getting fewer as the day wore on; none could be seen in the evening hours before the sunset.

As an item of interest, it is recorded that all the pale-billed birds regarded as *melanophris* showed apparent discrepancy in size, some appearing much larger than others; but no other distinguishing feature could be observed, though the larger ones seemed to keep further away from the ship.

July 15, 9 a.m.—Many Mollymawks, but all pale-billed (*i.e.*, *melanophris*), no dark-billed (*i.e.*, *chlororhynchus*) birds to be seen. A few Sooty Albatrosses, all sooty, were still in attendance, and a few Cape Pigeons were following the ship. *Pterodroma macroptera* still seen in the distance. Half a dozen Albatrosses, including a couple of fine snowy ones, the others certainly being the same species in more immature plumage were about the ship all day. A snowy one settled on the water where it appeared almost pure white.

12 noon.—Ship's position, $35^{\circ} 23' S.$, $131^{\circ} 55' E.$; ship's run, 374 miles.

Same birds all day, all the Mollymawks pale-billed, and seeming to be of different sizes, but too windy to make good observations. No *chlororhynchus* seen all day, though continually looked for, and am certain nothing that could be taken for the Grey-headed Mollymawk (*Thalassogeron chrysostoma*) has yet occurred.

July 16, 7 a.m.—Still dusk: in the Gulf. Four Mollymawks; two came near, one *melanophris*, the other *chlororhynchus* or *chrysostoma*.

8 a.m.—Half a dozen Mollymawks, all dark-billed.

9 a.m.—Only two Mollymawks, but these came close in, and they were seen to be Grey-headed (*T. chrysostoma*) without any doubt: different wing lining from *chlororhynchus* and larger birds, stumpier like *melanophris*. This confirms Dr. Macgillivray's observations, and also settles Gould's data, "Common in Bass Strait," which has been in dispute for some time.

Four of this species followed the ship right up to the Outer Harbour, Adelaide; yet there is no specimen in the Museum at Adelaide. One immature Albatross appeared about 9 a.m., and was joined by another, and these also kept with the ship to the Outer Harbour. These are quite different from any seen across the Bight, having an all dark tail, mottled back, mottled head, all-brown wings, a brownish band across breast and more brown underneath the wing. These are immature birds of the Wandering Albatross (*Diomedea exulans*). A dark Petrel, maybe a Shearwater, was seen, but it was flying rather high for this group.

Left Adelaide after dark.

July 17, 8.30 a.m.—Two Cape Pigeons and two Mollymawks, apparently both *melanophris*. 9.30 a.m.—Eight Mollymawks, mostly pale-billed, but one Grey-headed (*T. chrysostoma*) came close in. One very brown immature Albatross, darker than those seen yesterday. 12 noon.—Ship's position, $37^{\circ} 30' S.$, $130^{\circ} 50' E.$, 196 miles from Adelaide. 4 p.m.—Twenty to thirty Mollymawks, nearly all *melanophris*, but two Grey-headed (*chrysostoma*) were recognised. Still only one very brown immature Albatross and a couple of Giant Petrels.

July 18 and 19.—In Melbourne. Left after dark on 19th.

July 20, 8 a.m.—One Giant Petrel, one Cape Pigeon, two *melanophris*, and one *chlororhynchus*: this came close in and was undoubtedly this species. 9.30 a.m.—About a dozen Mollymawks, nearly all *melanophris*, but two *chlororhynchus*, were seen close in, and at least two *chrysostoma* whose grey heads and large size separated them; close at hand, the culmen coloration was paler, and in the distance the dark bill distinguished them from *melanophris*; when the light shone on them the grey head was easily noted. Two Giant Petrels

were also present. 11.30 a.m.—Only *melanophris* present, the others having left, and only *melanophris* followed the ship all day afterwards. Half a dozen Giant Petrels kept them company. 12 noon.—Ship's position, $370^{\circ} 56' \text{ S.}$, $149^{\circ} 19' \text{ E.}$; 30.4 miles from Melbourne, getting nearer Cape Howe. A fine adult Albatross came along, white head and back, with basal part of wings blotched with white, but tail quite black; underside of wings showed solid black primaries. It was a fine adult Wandering Albatross (*D. exulans*), and certainly quite a different species from the Snowy (*D. chionopectera*) seen in the Bight. It, however, did not stay long. At 4 p.m., a Cape Pigeon was noted; all the Mollymawks were pale-billed, and there were still a couple of Giant Petrels present. At 5 p.m., the Cape Pigeon was not noted, but otherwise the birds were the same.

There has been a recent discussion concerning private collections, but what is the value of these observations without confirmation by means of specimens? These remarks must be taken for what they are worth, until tested by the examination of actual specimens.

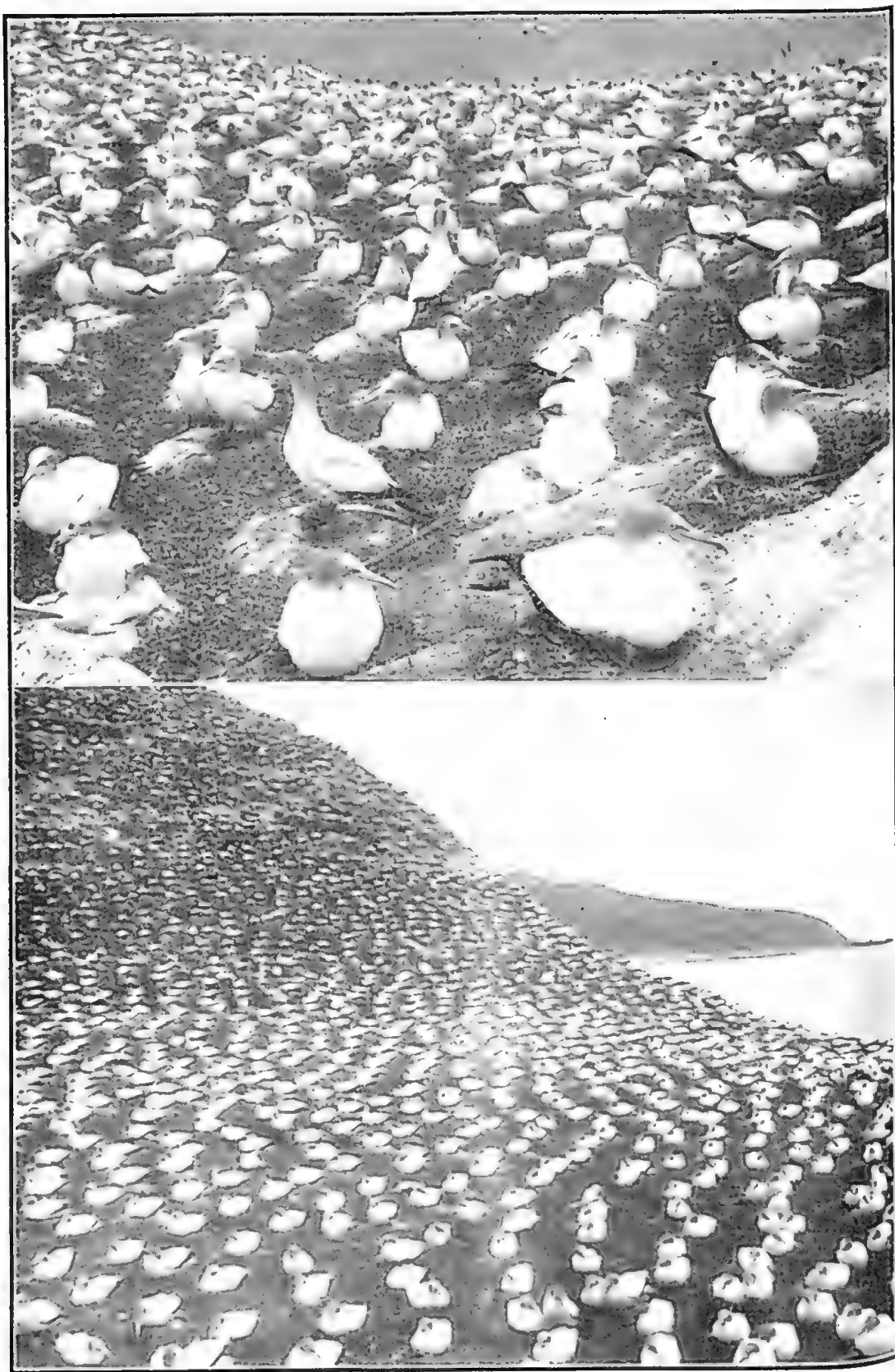
I have here outlined the distribution of certain Petrels in winter along the southern coast of Australia, and my observations probably will be found to coincide with those of other writers; these were penned and dispatched from board ship, without reference to any other records, so that no prejudice entered into the matter in any way.

I noted that the Albatross of the Bight is a form of the Snowy (*D. chionopectera*), that it did not occur near Cape Leeuwin, but only well to the east of it, and that it left before the gulfs were entered, when a different Albatross of the Wandering (*D. exulans*) series took its place, and on the East Coast a single adult specimen of the *exulans* type was noted. With the same range as the Snowy occurred the Sooty Albatross (*Phæbetria fusca*), and when the gulfs were reached it also vanished and did not occur again.

On the west coast of Western Australia, right round the south coast and nearly across the Bight the Yellow-nosed Mollymawk (*T. chlororhynchus*) occurred. In the gulfs it was replaced by the Grey-headed (*T. chryostoma*), which was noted through Bass Strait, but was lost on the East Coast. In the eastern portion of Bass Strait it was accompanied by *T. chlororhynchus*, which did not come up the East Coast.

The Black-browed Mollymawk (*T. melanophris*) and the Giant Petrel occurred everywhere, save that I did not notice the former at Fremantle, and both accompanied the ship up the East Coast. Odd Cape Pigeons were seen all the time at the intervals from Fremantle till up the East Coast. It is noteworthy that I did not meet with the Shy Albatross (*D. cauta*), of Bass Strait, at all.

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The Gannet Rookery. Cape Kidnappers, N.Z.

Photo. by H. S. Cottrell, R.A.O.U.

The Gannets of Cape Kidnappers

By HORACE S. COTTRELL, R.A.O.U., NAPIER, N.Z.

There are but few cities that are privileged to be placed within sight of one of those natural wonders—a Gannet nesting place. Standing beneath the avenue of Norfolk Island Pines (*Araucaria excelsa*), that grow so profusely along the seafront at Napier, you can see the white area on the cliffs at Cape Kidnappers, away at the southern end of the bay. That spot is, I believe, the only Gannet nesting-place in the world, that is situated on the mainland. All others are on islands, and most of them are very inaccessible. The journey to see the Gannets is indeed just a pleasant day's outing, and hundreds of folk, including old ladies, have been there to feast their eyes on one of Nature's most charming spectacles.

It is my desire that in the years to come I may personally conduct many members of the R.A.O.U. to see the birds. But till that time comes let us imagine that this is a trip to Cape Kidnappers.

Having arranged for a motor car to convey us to Clifton sheep station, 14 miles from Napier, let us consult the tide timetable, for if we neglect this we are quite likely to be marooned at the cape or perchance be caught by the sea while proceeding along the shore.

Passing along the sea-front at Napier, past the Paddling Pool, Sand Pit, and playgrounds, with hundreds of kiddies enjoying themselves in the sunshine, we come to the outskirts of the city, and here, in the swamp lands to our right, we see many Pukako or Swamp-Hens (*Porphyrio melanotus*) wading round in the shallow water, quite close to the railway line, and also many Pied Stilts (*Himantopus picatus*) are to be seen. Soon we proceed along country lanes, past prosperous homesteads, and then eventually the car comes to a stop in the shingle of the beach at Clifton. Here we leave the car, distribute among the party our cameras and provisions, and proceed along the shore. We now have a six-mile walk in front of us, a very pleasant walk indeed, along a hard, sandy shore, beneath towering bluffs, with charming views and vistas at every turn. Even without the wonder of the Gannet nursery as its objective, this journey is well worth while. If our interests are entirely and solely ornithological, we shall find much of interest, though I am inclined to believe that the ornithologist is the nature-lover *par excellence*, with an interest that covers all phases of nature, though he be a specialist in birds.

In the gullies we observe Grey Fantails (*Rhipidura flabellifera*); these native birds are very plentiful throughout New Zealand, are always seen in pairs, and are friendly little birds. The Silvereye (*Zosterops lateralis*) is also to be seen ashore, while along the coast the Black-backed Gulls (*Larus dominicanus*), Red-billed Gulls (*Larus scopulinus*), and White-fronted

Terns (*Sterna striata*) are quite plentiful. If we are fortunate we will find the Terns nesting at the Black Reef, and note that these birds lay their eggs on bare rock, or shingle banks.

And now just as we begin to think that the cape must be indeed more than six miles from Clifton, we come suddenly within sight of it, gleaming white in the summer sunlight. From here we can see the Gannets wheeling round the nesting-place on the pinnacles of the cape. For about a mile we proceed across the bay, where there was once a whaling station in the "good old days." Hunger and thirst may here overtake us, so we will rest awhile at the foot of the track, and refresh ourselves before undertaking the most strenuous portion of our pilgrimage.

Up a steep track, across a ravine, and still we clamber up the steep hillside. Quite weary and very much out of breath, we at last reach the summit, to be all but overcome by the wonder of the spectacle spread out before us.

Just below us we see the Gannets' nesting-place, all white and shining with the sapphire sea all but surrounding it. We see the patient Gannets on their nests, and thousands of them in the air. No photograph or motion picture, however fine, can convey the wonder of the scene.

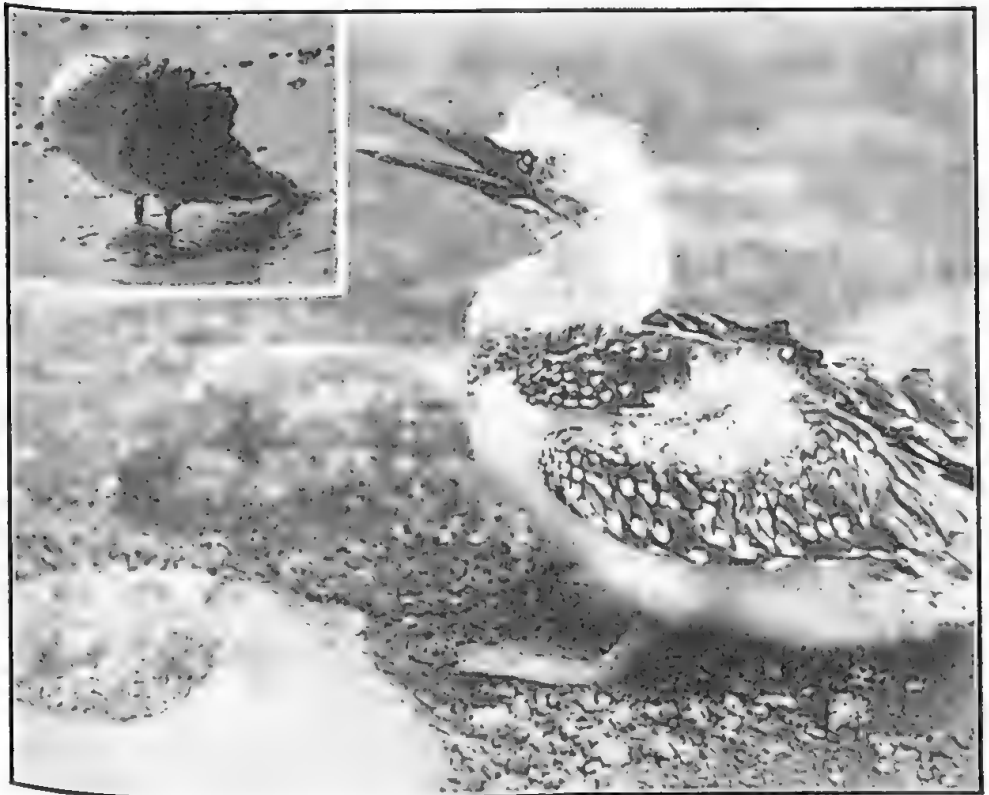
Having feasted our eyes, and at the same time regained our breath, we proceed down the narrow, hazardous track to the nesting-ground. The greatest surprise to the uninitiated is that the Gannets do not leave their nests when people approach. In fact, when the birds are incubating, or when the chicks are young, the sitting birds have to be forcibly pushed off the nest. We have discovered, however, that early in the season (August), before the eggs are laid, or at the end of the season (April), when many of the birds have left, and the chicks are in an advanced stage, the birds do not stay by the nests when approached. Last August we paid a visit to the spot, and were treated to a most thrilling spectacle, when we appeared on the hilltop above the nesting-ground. Several hundred Gannets that were occupying the ground took wing and wheeled around.

So that we may see the birds in all stages of development, we have made our journey in January. Standing there watching the birds there are quite a number of things that have our attention. Firstly, we take a rough estimate of the number of nests, let us say 2,000, i.e., 4,000 birds, and with a chick to each nest 6,000. The nests are drawn up in regular lines, and it is quite amusing to note the passage of a bird from the centre to the edge. It scrambles along in an ungainly fashion to an accompaniment of pecks from its neighbours. For the Gannet does not rise from a flat surface, but scrambles to the edge, and throws itself over. The nests themselves have our attention. They are merely conical mounds, or depressions, in the hillside; the nesting material is seaweed.

To study the life history of the Gannet it is necessary to make several trips to the cape in a season, and because most visitors

only make one journey in a season (perhaps a life-time), very little was known locally till we took the matter up in September, 1920. The books available told very little, and so we found we had almost a virgin field. With the help of members of the R.A.O.U. and naturalists in Great Britain and elsewhere, we now have quite a library of articles and books on "The Gannet."

The Gannet lays one egg, and this is incubated by both birds in turns; in about six weeks out comes the chick, a poor, little naked thing of a slate colour. It grows rapidly, and in about 14 days is completely covered with white down. Dark, white-tipped



Young Upper : Sleeping. Lower : Partly feathered

feathers now begin to push their way through the down, and at seven weeks the chick has its handsome speckled coat.

But let us go back to our observation of the birds! Watch for awhile, and you will see a bird select its mate from the thousands of others, and settling in beside her there will be such a love-making and demonstration of affection.

Then the fish being disgorged for the young one, the previous sitter scrambles off to the edge. It is interesting to see the chicks in the speckled stage, standing on tip-toe, taking exercise preparing for the great day when they will fish for themselves.

You will notice some birds with their feet firmly planted on their eggs or their little chicks. This would seem to be an instinct that would say, "if you have a good egg or chick, keep

your foot on it." There is really no need for this procedure at the cape, but a study of other nesting-grounds shows that many of them are on very precipitous rocks and cliffs, so that there is great need there to keep a good hold of the egg.

It is a glorious sight to watch the Gannets fishing. Sometimes they fish "solo," but it is quite usual to see hundreds of them together, taking toll of a shoal of herrings.

All food is secured by diving. You see a bird pause in its majestic flight, fall like a stone towards the sea, disappear with a great splash; it re-appears shortly, and after a momentary pause takes to the wing again. Nature has provided the Gannet with a unique shock-absorber, the system of subcutaneous air cells, which is so strange a feature of this bird's anatomy.

The Gannet is indeed a handsome bird, with its pure white plumage, its dark wing feathers, and buff-coloured head. The Gannet (*Sula serrator*) is allied to *Sula capensis* of South Africa, and *Sula bassana* of Great Britain. The main point of difference in these three species seems to be the tail of *S. bassana* has white tail feathers; *S. capensis*, black feathers; and *S. serrator*, a tail that is both black and white.

The Gannets at Cape Kidnappers begin to arrive in August, and the nesting-ground is deserted by the end of April. The most persistent "popular" question concerning the Gannets is, where do they migrate to? The answer being that they do not migrate, but distribute themselves over the ocean wherever food is to be found, till the call comes to mate again. Many interesting problems present themselves to the ornithologist. Do the birds occupy identical nests each year? Do they even come back to the same nesting-ground? Do they pair for more than one season? Without an elaborate system of marking it would not be possible to answer these queries.

The nesting-place at Cape Kidnappers being so easily reached, and the Gannet being the easiest possible photographic subject of birds in the wild, it is likely that the Gannet is the most photographed bird in Australia and New Zealand. Bird-lovers will be interested to know that Cape Kidnappers has been created a national park and Bird Sanctuary, and that in spite of the publicity given to them, and the large number of persons who annually visit the nesting-ground, birds are steadily increasing.

And now our party must return by the way it came. We bid farewell to the birds as we pause on the hill-top for one last look ere we scramble down the hill-side. We pass beneath the great cliffs in the cool of the summer evening, and as the sun dips behind the Ruahine Ranges, we know that happy indeed are those who love nature, those who enrich their lives by enquiring into the most beautiful, most wonderful things that Nature holds for our pleasure. The rarest opportunities, the keenest delights are for those who know and love the birds and trees and flowers.

How Settlement and Other Factors are Affecting Native Birds.

By A. S. LE SOUEF, C.M.Z.S., Taronga Park, Sydney.

Australia, with its immense spaces, varying climate and seasons, has a noticeable ebb and flow of bird life. One can only get a fair idea as to how our avian life is faring by extended observations in one district. Specially valuable in this respect is the work of Mr. Isaac Batey (*The Emu*, vol. vii., p. 2), and the interesting paper by Mr. Neil McGilp (*The Emu*, vol. xxii., pp. 237, 274).

A point that may be stressed is the immense difference made in bird life by the season. Under favourable conditions, the rule is, in many species, for large clutches and two or three hatchings in the year. In dry times, not only may no birds be reared, but many of the adults may perish.

It can be stated with confidence that, in an average year, many more birds are hatched than can survive. Every adult pair rears from one to nine or more young, yet at the beginning of the following season the average numbers are about the same, natural mortality being 100 per cent. per annum. The chief governing factors being food supply and natural enemies.

Observations of the Blue Wren or Superb Wren-warbler (*Malurus cyaneus*) in Taronga Park, Sydney, extending over several years, are interesting in this respect. In an area of 40 acres of open bush, flower gardens, lawns, etc., we have four families of this species, each containing about six birds, or 24 in all. Each family group averages two clutches a season, bringing off six young birds, a total increase of 24 for the whole park. As the park faces the harbour, and every suitable living area in the vicinity is already occupied, the wrens have no room for expansion, the area is "*Malurus replete*." The average numbers do not vary from year to year, and as there are practically no natural enemies, food supply is apparently the limiting factor.

There has been a very decided disturbance of bird life in our settled districts, some species being seriously reduced in numbers. Only by a study of the causes of this disturbance can we hope to deal intelligently with the matter.

In attempting to define these causes, no hard and fast rules can be laid down, as some species may be affected by a variety of factors. The main points may be stated to be in order of importance:—

- (1) Settlement, disturbance of natural conditions.
- (2) Introduction of the fox, cat, rabbit, starling, etc.
- (3) Laying poison for rabbits, poisoning species that are destructive to crops or stock.
- (4) Trapping for the market.
- (5) Shooting of game birds.

Settlement has its effect in two ways. First, the clearing of the forests and scrub lands deprives certain species of their environment; secondly, disturbance of the pastures by stock and rabbits drives away birds that are dependent on the seeds of grasses and herbs, or are of a nervous and retiring disposition.

The felling of timber and scrub is, however, not all loss as far as bird life is concerned, for the clearing of the land opens up the way for its occupation by types which live in the open. The net result may not be very great, but the change in species is decided. Other things being even, it is wonderful how quickly the Magpie (*Gymnorhina*); Grallina; Pipit (*Anthus*); and Larks, occupy the vacant area. The Superb Wren-warbler and the Yellow-tailed Thornbill follow up the scrub-loving *Acanthiza* and *Sericornis*.

The principal birds affected by these disturbing factors appear to be the:—

Mallee Fowl (*Leipoa ocellata*), Black-breasted Quail (*Turnix melanogaster*), Bronzewing Pigeon (*Phaps chalcoptera*), Flock-Pigeon (*Histriophaps histrionica*), Squatter Pigeon (*Geophaps scripta*), Wonga Pigeon (*Leucosarcia melanoleuca*), Bustard (*Eupodotis australis*), Southern Stone-curlew (*Burhinus mag-nirostris*), *Scarlet-shouldered or Paradise Parrot (*Psephotus pulcherrimus*), *Chestnut-shouldered or Turquoise Parrot (*Neophema pulchella*), *Scarlet-chested Parrot (*N. splendida*), Ground-Parrot (*Pezoporus formosus*), *Night-Parrot (*Geop-sittacus occidentalis*), Superb or Barraband Parrot (*Polytelis barrabandi*), and Smoker or Regent Parrot (*P. anthopeplus*).

In the main, those species that range beyond the settled areas are yet quite in their normal numbers, while the few that are confined in their habitat (marked with an asterisk) are scarce.

The Mallee Fowl, although enjoying a wide range, appears to be nowhere numerous, and to have disappeared from some of its haunts. This species is the victim of the fox, which has spread over its entire habitat with the exception of North-West Australia.

The Black-breasted Quail apparently never has been very numerous, and seems to have quickly disappeared before settlement.

The Bronzewing, Flock, Squatter, and Wonga Pigeons are affected by settlement, not only in the altered environment, but from the fact that they are "game birds" to the average man and boy whenever met with, and they seldom get a chance to establish themselves in "man's sphere." However, the first three mentioned have an immense range over the continent in districts where they should be safe for generations to come. The Wonga Pigeon has found an unexpected haven in the prickly pear area.

The Nutmeg Pigeon (*Myristicivora bicolor*), that nests on islands off the Queensland Coast, being isolated and easily procured, will need special watching. It has been reported that these birds, as well as "Australian Noddy" eggs, are being sold in San Francisco. It would be extraordinary if they were not ex-

exploited for food purposes by the trepang fishers operating along the Barrier Reef. "Wonga Pigeon" appears on the bill of fare on the Union liners trading to America. The birds are not Wongas, but might easily be the Nutmeg Pigeon.

The Southern Stone-Curlew is another species that the fox finds no difficulty in getting. The habit of the bird in advertising its presence at night by its plaintive call helps reynard to locate him.

The Bustard labours under a heavy handicap in being called a Plain Turkey. The fact that it is protected seldom has any effect if there is a chance of putting it on the table. Being a ground bird, doubtless, a good many are taken by foxes. Both the Stone-Curlew and the Bustard are now comparatively rare in eastern and southern Australia, where they were once so numerous. They both, fortunately, have a wide range, and are common in some parts of the continent.

It is when we come to the Parrots that we find the most striking evidence of the effects of opening up the country on our birds. Several species have become so scarce that it looks as if we were going to lose them altogether.

The habit of the Scarlet-shouldered Parrot in nesting in an anthill, a position very exposed to enemies, has evidently been the cause of its being driven away by settlement. Other members of the genus, notably the Red-backed Parrot (*Psephotus haematotus*), the Blue-bonnet (*P. haematogaster*), and the Many-coloured (*P. varius*) that nest in trees, are numerous throughout the pastoral and agricultural districts of their range.

The members of this genus are usually able to hold their own well in mixed company. Some are even too aggressive to be kept safely with other birds, while we read of a female Red-backed Parrot turning out a Starling from its home and taking possession itself (*Avicultural Magazine*, Series 4, VI., No. 3, p. 72).

The Grass Parrots of the genus *Neophema*, on the other hand, are extremely shy, quiet, and retiring in captivity, and I believe that, owing to their sensitive disposition, they are quite unable to stand any change in their environment. At any rate, this seems to be the case with the Chestnut-shouldered and the Scarlet-chested Grass Parrots.

The Chestnut-shouldered Parrot, better known perhaps as the Turquoise, was last reported by Dr. Roberts, from Stanthorpe. Mr. G. A. Heumann states that he saw two specimens at Ooldea in January last, while two were reported to have been secured and taken to England by a representative of the Zoological Society of London.

The Smoker (Black-tailed) and the Green Leek (Barraband) Parrots seem to have become scarce to what they once were. The former must be affected a good deal by the clearing of its natural habitat, the Mallee, and to a slight extent perhaps that, being found in a dry district, it is easily caught by trappers. Barraband's Parrot is reported to have suffered severely when

rabbit poisoning was carried out extensively in the Riverina. Since this method of killing the rabbit in that district has been discontinued it seems to be coming back. I saw a fair number on the Murrumbidgee, near Carathool, recently.

The Ground Parrot and the Night Parrot must be affected by their environment. Disturbance by stock and rabbits, as well as frequent bush fires, have reduced, the latter at any rate, to vanishing point.

SUMMARY.

The future well-being of our birds depends to some extent on the economic progress of the country. Settlement is going on at an ever-increasing rate, and the consequent clearing of the land leads to a corresponding change in bird life.

The Union has already suggested "That farmers be urged to establish suitable breeding areas for insectivorous birds on all their properties." To this might be added a recommendation not to plant exotic trees. Australian birds have specialised to live in Australian trees. It can be noted that Starlings, Sparrows, Goldfinches, etc., collect where pines, oaks and elms, box-thorn and briars give them the shelter that they are used to.

In view of the progressive clearing of the country, the value of adequate reserves is apparent. Most States have plenty of these, but, being mostly unpatrolled, they are not of material value.

The timber reserves, under control of the Forestry Departments of the various States, are splendid natural ranges for our arboreal birds. It is to be hoped that the Union will be able to get them officially recognised as such, and the birds therein brought under the control of the rangers.

We must recognise that farmers may find it necessary from time to time to destroy some birds that are destructive to crops or stock. In the Riverina, the Australian Crane has learnt to follow up the drills and take sprouting corn, and many have been shot or poisoned in consequence. Bare-eyed Cockatoos, Galahs, and Magpies suffer from the same reason. King Parrots sometimes attack maize crops, while some parrots (*Platyseridæ*) and lorikeets, as well as Satin Bower-birds and certain Honey-eaters, take fruit. This factor again helps to reduce bird life in the settled districts, but, fortunately, it appears to be very local, and to make comparatively little difference to the species concerned.

The continued spread of the fox may be serious to two or three species, but in the main the balance of life should adjust itself, as it has in other parts of the world, where this animal has lived for ages contemporary with large bird faunas.

Exploiting birds for market purposes has now been stopped, and the operations of sportsmen regarding game birds are fairly well under the control of the State Authorities.

It only remains for the value and beauty of bird life to be recognised by the people generally, especially the man on the land, to make them safe for posterity.

Notes on Honeyeaters.

By P. A. GILBERT, R.A.O.U., Kalembe, N.S.W.

Read at N.S.W. Branch, R.A.O.U., and Royal Zoological Society, 18/5/23.

The numerous and various forms of birds known as Honeyeaters present a sublime display by Nature, of her unconscious methods of preserving species as we understand them. Some are so closely allied that with difficulty we decide they are not related; while others have such marked differences, that no trouble whatever is experienced in allocating them to their respective positions in our scheme of classification.

The family comprises about 150 species, made up of 30 odd genera.

ZOO-GEOGRAPHICAL REGION.

The Geographical Distribution of Honeyeaters is essentially confined to the Australian Region, which includes Australia and Tasmania, the Celebes, the Moluccas, Papua, all the Islands in the Pacific Ocean, from the Carolines to the Low Archipelago, including the Sandwich Islands. The islands of Bali and Lombok to the north-west of Australia, made famous by A. R. Wallace as the terminating points of the Indian and Australian Regions, have a very deep channel running between them, which is said to be of great antiquity. This boundary channel was designated Wallace's Line by T. H. Huxley, in honour of its discoverer. Across this narrow strip of water one species, *Meliphaga* (*Ptilotis*) *limbata*, so far, intrudes on the Indian Region, and is found on the island of Bali.

SUB-REGIONS.

In the Australian Sub-region the distribution of this family is very extensive, every nook and corner being inhabited. From Cape York to Tasmania, and from the most eastern points to the most western reaches, some member of this family is present; Australia, therefore, is the stronghold of this family, and has every indication of being the source of origin of Honeyeaters, containing, as it does, about 68 species of 23, or so, genera.

In the Papuan Sub-region many interesting forms are found, but the genera and species are considerably less in numbers than those obtaining in Australia. In the Polynesian Sub-region, smaller members of the family are present, but in nothing like the numbers existing in the two previously-mentioned sub-regions. The Sandwich Islands have two species, while New Zealand (Region) has recorded a few distinctive species.

DISTRIBUTION OF GENERA.

The genus *Myzomela* probably embraces a wider area in distribution than any other genus, having representatives in Aus-

tralia (but not Tasmania), Papua, most of the large and small islands surrounding Papua, the Caroline Islands, New Caledonia, New Hebrides, Fiji, Tonga, and Samoa. Next in extent is the numerous genus *Meliphaga* (*Ptilotis*), which is spread throughout the length and breadth of Australia, including Tasmania. Papua and the surrounding islands have many interesting forms; one species, *Meliphaga limbata*, as previously mentioned, crosses Wallace's Line, it being found on the island of Bali. A few members are also found in the Polynesian Sub-region, principally on the Fijian, Tongan, and Samoan Islands. The Friar-birds (*Philemon*) are others that are most widely distributed over Australia (but not Tasmania). The Papuan Sub-region has several widely-distributed species, while another is found in New Caledonia, and the adjacent islands. *Glyciphila* is a well distributed genus, small in numbers, but very hardy. Australia, Tasmania, Papua, Moluccas, New Caledonia, the Loyalty Islands, and the New Hebrides constitute its areas of dispersion. The remaining genera in their turn become more restricted.

There is every reason to believe that the dispersal of this vast family has originated from Australia, the largest land area of the Australian Region. The ocean between the points of nearest contact are easily traversed by birds. When the islands to the north of Australia have been exhaustively investigated, an extension of the distribution of Honeyeaters may result. Further, it is reasonable to suppose that as the dispersal has extended to New Zealand and other outlying islands, where no evident land connections have been in existence, that these islands to the north will, in time, yield new species over wider fields; assuming that pre-existing land connections are favourable in the scattering and formation of new species in distant parts. As Honeyeaters are strong fliers, the presence or absence of contiguous land would neither aid nor restrict their Geographical Distribution to any great extent. However, for the present, this inference, based, as it is, on possibilities, will be put aside.

DISTRIBUTION OF SPECIES.

It is now our purpose to consider only those species that frequent Australia and Tasmania. The comparative distribution of species of the same genus within the same sub-region is a fascinating study; the genus *Meliphaga* will serve to illustrate the peculiarities of closely-related species in this respect. That exquisite bird, the Helmeted Honeyeater, is a particular case where a form is so strictly localised that, unless zealously guarded, it could become extinct solely by the elimination of its habitat. This species is met with in Eastern Victoria, its stronghold being the Gippsland district. The Yellow-throated Honeyeater is also circumscribed in its distribution, which is Tasmania and the islands of Bass Straits. The Yellow-tufted

1. The following are the results of the experiment

1



Yellow-crowned Honeyeater.
Yellow-crowned Honeyeater.

New Holland Honeyeater.
Yellow-ruffed Honeyeater.
Photo by P. A. Gilbert, R.A.O.U.

Honeyeater has a much wider field, and occupies the coastal districts of Southern Queensland, N.S.W., and Victoria, while the distribution of the Singing Honeyeater over the whole of Australia typifies the hardy species, ready to adapt itself to all conditions of life, whether they be variations in food, climate, or other factors in relation to its environment.

HABITATS.

Every conceivable class of country provides a home for a Honeyeater—the humid tropical scrubs of Queensland, the various belts of open forest, and the heath lands that fringe the Australian coast in many parts. Even the mountainous tablelands offer congenial surroundings for many forms, while beyond the mountains and out in the arid interior, species have adapted themselves to the precarious conditions there obtaining.

STRUCTURE.

The family as a whole is uniform in structure, although there is a wide range in coloration of plumage. The red and black plumage of the male Scarlet (Sanguineous) Honeyeater in contrast with the brown female is a typical instance of sexual differences of color. The male Spinebill has a plumage made up of six or more colors and shades. The Striped Honeyeater is one of the lighter types, while the elegant black and yellow plumage of one of the most graceful of our birds, the Regent Honeyeater, should please the ardent admirer of handsome plumage. Another bird with well-marked contrast in plumage, as well as sexual differences in color, is the Pied Honey-eater, while the mention of the Helmeted Honeyeater, White-cheeked Honeyeater, Red Wattle-bird, and Blue-faced Honeyeater will be sufficient to illustrate further the diversities of plumage. In many species, little or no difference is discernible in the plumage of the sexes.

The brush-like tongue, although not peculiar to this family, is, nevertheless, an outstanding characteristic, the structure, however, differing from that found in birds outside this family. With Honeyeaters, the tongue divides about half-way from its basal end, and forms two bunches of fine horny filaments, which turn face to face when the tongue is in use. The nectar is sucked up by capillary action till it reaches a tube made by the folding over of each side of the tongue with the upper mandible, whence it is drawn into the mouth. The lower mandible is used in regulating the protrusible action of the tongue, the brush chiefly being extended from the bill (Spinebill).

HONEYEATERS AS SINGERS.

Many of the Honeyeaters are good singers, their songs being musical and decidedly sweet. Some are confined to a series of call notes, narrow in range and tone. A few are noted for the irritating sameness of their discordant notes. The garrulous

chatter of the Noisy Friarbird, alternated with the familiar "Kow-kow-kow" ringing out from some slender Eucalypt, towering to the sky, is a song that often dispels momentary thoughts of loneliness. The quaint call of the Gill-bird (Red Wattle-bird), whose raucous notes resemble the rattling of crockery on a dresser, is in marked contrast to the tuneful warble of the Scarlet Honeyeater. The shrill piccolo notes of the Black-chinned Honeyeater, which are really pleasing, not only convince us that Australian birds are true singers, by the variability of its song, but that, for its size, it will compare with any bird in the world for fulness and strength of sound. He who has not listened to the tinkling of Bell-miners—whose wonderful silvery notes are among the marvels of avian tone production—knows not the charm of bird song. From some thickly clad hill a single bell note may be heard, which in turn is answered by another bell note a short distance away, until a whole colony joins in. Gradually, the notes decrease one by one, till a solitary toll is heard, then all is quiet.

This generally occurs when an intruder approaches their breeding ground. The irritating alarm note of the Noisy Miner (Soldier-bird) is well known, but it has, however, a beautiful monotone call heard to advantage during the autumn, when congregated in small flocks. It resembles "Loo-la-la-la," quickly uttered several times in succession. The last three notes together equal in duration the first. On some parts of the Hawkesbury River these birds gather in small parties, and may be seen searching the blossom of *Banksia acmula*. Suddenly a bird will dart out into the air, and utter its notes; simultaneously rising with a series of short flights, until its song is finished. The Regent Honeyeater, although not a brilliant singer, is quite characteristic in the production of its small range of notes. A very graceful posture is assumed, the head is thrown back like a rooster about to crow, the wings are slightly raised, and as the notes issue forth the head is thrown forward, and reaches its usual position as the final note is uttered. The monotone call of the Yellow-eared Honeyeater is very agreeable, as it comes ringing from the dense growth wherein it delights to forage. It is delightful to watch the Tawny-crowned Honeyeater shoot up into the air like a lark, and remain stationary by the quivering movements of its wings, while it utters its plaintive whistle and warble. Then, with a series of dives, it descends to the earth and disappears among the heath. The White-cheeked Honeyeater, too, during nesting season, will suddenly rise into the air singing his song all the while, finally darting back to the bush as the last note is being made.

It is hard to conceive a grander sight in the world of vegetable life than a gigantic Eucalypt, which has defied the storms of years, clothed in a mass of creamy blossom. The thick clusters of flowers attract myriads of insects. These together, entice all

forms of bird life. From the medley of song created by the commingling of notes of nectar-hunting Little Lorikeets, Honeyeaters, and insect foragers, the call of the Black-chinned Honeyeater is heard in this babble of song as a solo. About sunrise, or just before dusk, is the most advantageous time to hear the songs or calls of Honeyeaters.

INTERRELATION.

Many Honeyeaters play an indispensable part in the cross-fertilisation of our Native Flora, notably in the orders of plants known as Proteaceae, of which Banksias are typical, and Epacridaceae, to which the familiar Australian Heaths and Five-corners belong. The Spinebill is strikingly useful in the cross-fertilisation of the Heath, *Epacris longiflora*. The corolla of this flower is long and tubular, measuring an inch or more in length. Just inside the tubulate corolla there are five anthers loosely attached to their filaments, which adhere to the corolla. The stigma, like a pin's head, protrudes from the corolla on a long filamentous style. The bill of the Spinebill is one inch in length. As it thrusts its bill into the corolla to reach the nectary, the anthers shed their pollen over the forehead, lores, and cheeks of the Spinebill. When the next flower is probed the stigma comes in contact with the pollen-dusted face of the visiting bird, and thus Nature unconsciously ensures cross-fertilisation. The same process has been observed between the Tawny-crowned Honeyeater and various species of *Styphelia*. The Scarlet Honeyeater is fond of feeding on the nectar of the various species of Mistletoe, and may perform no small part in their cross-fertilisation. The elegant attitude the smaller species take on when searching for nectar is amusing and interesting. Sometimes a flower is in a difficult position for them to examine thoroughly, whereupon they actually lie on their backs, thrust in their bills, and remain thus till the delectable nectar is completely sipped up. They will then toss themselves into the air, and recover their normal position on the wing.

FOOD.

As regards food, most of the Honeyeaters are omnivorous. During late autumn many open forest species visit the coastal districts, and remain throughout the winter, where they subsist almost entirely on the nectar gathered from flowering Eucalypts, Banksias, and Epacrids. In fact, the profuse flowering of Banksias, everywhere along the coast, and lasting over the winter months, is the cause of regular seasonal movements of some of our Honeyeaters. The Gill-bird arrives from the west early in the autumn, and remains till the end of winter. At present, on certain parts of the Hawkesbury River, some hundreds of Noisy Miners are gathered together, and may be seen feeding among clumps of tall Banksias.

However, during spring and summer, insects constitute their main sustenance, while fruit, berries, and seeds of much of our Native Flora are by no means despised. Around swampy places, worms, snails, and the like are sought after by the Yellow-winged (New-Holland) Honeyeater.

BREEDING SEASONS.

With regard to the breeding period, some species may be found nesting almost any month of the year in good seasons, when rainfall is regular, and the heat of summer not overpowering. Others are decidedly seasonal in their nidification. The Tawny-crowned, White-cheeked, and New-Holland Honeyeaters are species that breed almost at any time. The White-naped and Black-chinned Honeyeaters will in favourable seasons extend their breeding from July into February. The scrub-frequenting species usually start in September, while the Friar-birds and the White-breasted Honeyeaters typify the later breeders, whose nesting times arrive about October.

NESTING HABITS.

In such a numerous family as the Honeyeaters, it is to be expected that their habits of nidification are widely different, and such is the case. Two species of *Glyciphila* build large domed nests after the manner of some of our scrub birds. All the other members of the family construct open cup-shaped, or deep basin-shaped nests. The situations are likewise various. Some, as the Tawny-crowned Honeyeater, are placed in thickets or clumps of growth near the ground. The nest of the Noisy Friar-bird may sometimes be seen swinging to and fro in the topmost branches of a slim and stately Gum-tree (*Eucalypt*), 100 feet from the ground. Between these two extremes in sites, all conceivable places are resorted to.

The dainty little nest of the Scarlet Honeyeater, when constructed of newly stripped Turpentine bark (*Syncarpia laurifolia*) is exceedingly pretty and neat. The bark is laid round in a circle more than it is interwoven. The lining is often completely composed of long pieces of horsehair wound round to their entire lengths. The nest is usually tucked into a twiggy bunch of leaves, secure, and well out of sight. For neatness and beauty, it would be difficult to name a more handsome nest than that of the Yellow-faced Honeyeater. The well-chosen lengths of grass are uniformly placed together, and held in position with cobweb, while the outside lining of green or dry lycopod, moss, or lichen, gives it a distinctly attractive appearance. This is generally suspended in a drooping branch of an Oak-tree (*Casuarina*), which this species greatly favours for nesting in. It is, however, by no means exclusive in its selection of this tree. Next, we may mention the unique nest of the Black-chinned Honeyeater. This is sometimes placed at an



Fuscous Honeyeater. Male, Female and Young.
Regent Honeyeater.

Yellow-tufted Honeyeater at nest. The flower of *Banksia*, on which many species feed.

Photo by P. A. Gilbert, R.A.O.U.

immense height from the ground, in a thick cluster of leaves. It is constructed mostly of fur or cow-hair, thickly felted together between a somewhat meagre foundation of fibrous bark. The lining is often composed of fur, short hair, or sheep's wool. It is an exceptionally cosy structure for an open nest. Bark and fibre of some sort is the basis of most of the nests of Honeyeaters.

EGGS.

The numbers of eggs laid for a sitting vary from one to four. In Western Australia the Brush Wattle Bird invariably lays one egg, while eastern form frequently deposits one, although its normal set is two. Most of the smaller forms lay two or three, the number varying with the season. The Striped Honeyeater, *Mysanthes* (Miners) and Friar-birds lay three or four, the Gill-bird and the Yellow Wattle-bird two and sometimes three. The Scarlet Honeyeater's egg is probably the smallest, measuring as short as 0.56 of an inch, while the Noisy Friar-bird's egg measures up to 1.45 inches in length.

In colour and markings the eggs vary considerably, both in intensity and disposition, over a widely selected series of specimens. Even eggs of different members of the same species often vary beyond all recognition. The pearly white eggs, spotted with purple, of the Yellow-eared Honeyeater make a pleasing contrast with the rich reddish-buff specimens, with darker markings, of the Regent Honeyeater. A particularly striking egg is laid by the Helmeted Friar-bird of Gippsland, while another distinctive example is that of the Spiny-cheeked Honeyeater, which is delicate in tint, with prominent markings.

YOUNG.

The study of the development of young Honeyeaters is one full of biological interest, not only in its relation to the species of birds in particular, but in the study of the history of bird life in divided into two stages. The first may be described as the possible to state when one phase ends and the other begins.

During the first half in the nest, the young bird's growth is chiefly towards the filling out and functional development of the various organs and muscles. The perfecting of the eye, and the gradual metabolism of the nutritive material necessary in the growth of feathers, cause a heavy drain on the nourishment supplied by the parent birds. While throughout the second half, the bill rapidly grows, feathers break their sheaths and clothe the body, and most of the external characters that go to make the species, visibly unfold themselves.

Briefly, we shall take the New-Holland Honeyeater. Two eggs are laid, frequently on consecutive days. These take fourteen days to hatch. The young are almost entirely naked, and are blind. Several days later the eyes gradually begin to open. Meanwhile, the young feathers (*Neosoptiles*) make rapid

growth within their sheaths, and, towards the end of the latter half of the period the young are in the nest, they quickly out-grow their sheaths, which peel off, and leave the young clothed in soft, downy feathers.

At seven days old the bill measures about 0.43 of an inch, and just before the young one leaves the nest the bill has grown another 0.19 of an inch, making the total length of the nestling's bill 0.62 of an inch. After leaving the nest, the bill grows another 0.18 of an inch before the bird reaches maturity. As the young one leaves the nest, its breast is faintly striped, the outer webs of some of the wing feathers are tinged with yellow, while the eyes approach more closely those of the adult bird. Definite clefts are noticeable in the tongues during the second week in the nest, the brush form developing as the young ones mature.

The young Tawny-crowned Honeyeater is dissimilar in markings to the parent as it quits the nest, its striped and mottled plumage rendering it hard to detect in the low undergrowth wherein it hides. As its fledgling days are spent on the ground, this would no doubt afford protection from the sight of enemies.

The young of many Honeyeaters are, for two or more days following on hatching, fed almost exclusively on nectar, which, after being gathered by the parent bird, is regurgitated into the young bird's stomach by the adult, who thrusts its bill to its full length down the young bird's throat. The nectar thus fed, mixed with the digestive juices of the parent bird, constitutes a sort of Bird-milk. After the nectar has been fed to the young, the undigested portion is passed as liquid. Here Nature, in her wonderful provision, has caused the parent bird to consume this liquid excreta, thus preventing any fouling of the nest. Later, when insect life is fed to the young, the excreta is passed in the shape of a globule, which is readily carried off by the adult bird.

ENEMIES.

Like a great number of other forms of life, Honeyeaters have their fair share of predatory and parasitic enemies to contend with. Among the predaceous, the Butcher-birds, Crows, Bell-magpies, the smaller Hawks, mammals, and reptiles may be mentioned. Ants (*Formicidae*) cause deaths among the young of autumnal breeders. They swarm into nests, and compel the adults to forsake their offspring, which they devour. The most noteworthy of the parasites are the various species of Biting or Bird-Lice (*Mallophaga*), and the Bird-nest Fly (*Paseromyia longicornis*). It is doubtful, however, as to whether these parasites cause mortality. Another enemy of quite a different kind is that insidious avian encroacher, the Cuckoo, whose action, for want of a better name, we call Parasitism, is well known. Although several species of Cuckoos usurp the

nest from the rightful owners, the Pallid Cuckoo is the most frequent transgressor in this respect.

PROTECTIVE MIMICRY.

Protective mimicry among birds is not very common. Examples worthy of notice are those which exist between Orioles and Friar-birds on several of the large islands to the north, and north-west of Australia. On the island Gilolo or Halmaheira, A. R. Wallace observed an Oriole, and predicted that a corresponding form of Friar-bird would be found, which eventually took place. Friar-birds are fearless and pugnacious, always ready to do battle with any other bird that comes their way. Orioles are retiring and inoffensive birds frequenting the same localities, and with similar nesting habits to Friar-birds. It is, therefore, an advantage to Orioles if they preserve variations that help them in simulating Friar-birds.

ECONOMIC.

From the economic aspect, Honeyeaters are worth closer study. Many instances have been observed where the Silver-eye has commenced the damage with fruit, when Honeyeaters have taken advantage of the juice thus set free, and sipped it up as they do when probing a blossom for nectar. Some are reputedly destructive, but as little is known about the actual damage a species is supposed to do, it is obvious that plenty scope exists for a Department of Economic Ornithology, to investigate definitely the behaviour of many of our birds and their relation to the destruction of cultivated fruits and the like.

Until lately, thousands of Gill-birds were shot every year to appease the sporting instinct, and to add variety, of course, to the larder. The numbers now shot are steadily dwindling to hundreds. Whether or not this continuous shooting can go on indefinitely is a matter for conjecture. It is certainly another phase in the Economics of Bird life that should be closely watched. Gill-bird pie sounds ever so much better than grilled chicken; whether it excels it in flavour, epicures alone can tell us.

We go on recklessly killing many forms of life for food, or for other purposes, but awaken some morning to the realisation that the birds we have so wantonly and heedlessly sacrificed are well-nigh extinct. Many forms of life once common the world over have, in a few years of heedless destruction, become almost non-existent. As the Gill-bird is one of our quaint Australian forms, it is time, therefore, that some definite control was exercised to maintain it in its present numbers.

I cannot close this paper without expressing my gratitude to the Director of the Australian Museum, Dr. Anderson, who generously allowed me to show this fine series of valuable skins here to-night. Nor can I pass over lightly the trouble Mr.

Kinghorn went to in helping me to place before you this interesting and instructive exhibit.

SCIENTIFIC NAMES OF SPECIES MENTIONED.

White-naped Honeyeater (*Melithreptus lunulatus*); Black-chinned Honeyeater (*M. gularis*); Striped Honeyeater (*Plectorhyncha lanceolata*); Scarlet Honeyeater (*Myzomela sanguinolenta*); Eastern Spinebill (*Acanthorhynchus tenuirostris*); Tawny-crowned Honeyeater (*Glyciphila melanops*); White-breasted Honeyeater (*G. fasciata*); Pied Honeyeater (*Certhionyx variegatus*); Regent Honeyeater (*Zanthomiza phrygia*); Yellow-eared Honeyeater (*Meliphaga lewinii*); Singing Honeyeater (*M. virescens*); Yellow-faced Honeyeater (*M. chrysops*); Yellow-throated Honeyeater (*M. flavicollis*); Yellow-tufted Honeyeater (*M. melanops*); Helmeted Honeyeater (*M. leadbeateri*); New-Holland Honeyeater (*Meliornis novae-hollandiae*); White-cheeked Honeyeater (*M. nigra*); Bell-miner (*Manorhina melanophrys*); Noisy Miner (*Myzantha garrula*); Gill-bird (Red Wattle-bird) (*Anthochaera carunculata*); Yellow Wattle-bird (*A. paradoxa*); Brush Wattle-bird (*A. chrysoptera*); Spiny-cheeked Honeyeater (*Acanthagenys rufogularis*); Blue-faced Honeyeater (*Entomyzon cyanotis*); Helmeted Friar-bird (*Philemon yorkei*); Noisy Friar-bird (*P. corniculatus*).

The Fijian Crimson-Breasted Parrot

Pyrrhulopsis splendens.

By Dr. CASEY A. WOOD, M.A.O.U. and R.A.O.U.

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As surprisingly little is known about the nidification of the larger parrots, even of those common to public zoos and private aviaries, the following account of the discovery, in an unexpected situation, of the nest and eggs of a very attractive member of the genus *Pyrrhulopsis* may be of interest.

In the beginning of August, 1923, while engaged in a study of Fijian avifauna, I visited for that purpose the island of Kandavu. This combined coral and volcanic uplift is one of the largest as well as one of the wildest and most mountainous of the Fiji Group. It forms an irregular rectangle about 26 miles long and 4½ miles in width. It is very fertile, and at one time was a populous and well-known Polynesian province, but it has gradually decreased in importance since the decline of the whaling industry, and now there are not more than a handful of European planters, teachers, missionaries, etc., to a total population of 7000 natives.

Moreover, there are no rest-houses, no roads, only poorly kept trails between the villages, impassable to whites, and a crude, irregular postal service. As there are no telephones, telegraphs or wireless, there is no means of communication with the outside world except by native craft. An auxiliary cutter, owned and manned by Fijians, makes (or is supposed to make) weekly trips between two or three village ports and Suva, 70 miles away. In addition to this isolation, the island is, so far as regards its avian resources, fortunate in having excluded the mongoose, that imported nuisance so fatal to the bird life of Viti Levu and other larger islands of this interesting group. As most ornithologists know, those birds that feed or nest upon the ground or in low bushes readily fall victims to the rapacity of such of these voracious little beasts as infest the neighbourhood. Thirty-five years of this pest, in the first instance introduced by sugar planters to destroy the rats that damage the cane, have witnessed the partial or total destruction of many Fijian species on several of the largest islands.

Apart from a casual trade with Suva in the two species of Parrots resident on Kandavu—*Pyrrhulopsis* and a beautiful Parakeet, *Calliptilus solitarius* — the shooting of a few Wild Pigeons and an occasional Landrail for food, the natives do not molest their birds. For instance, they have not yet learned, like the South American aborigines, to eat Parrots as a delicacy.

For all these reasons Kandavu (in the Fijian orthography, *Kadavu*) has been of ornithological importance as a bird sanctuary since the days of Wigglesworth (*Aves Polynesiae*, 1865), and is much mentioned since then in the avian literature of the central Pacific Islands.

During my excursions about this island, I noticed that a single adult *P. splendens* came regularly every day, about the same hour, to a large, tall and rather bare Vesi tree (*Afzelia bijuga*). He sat there, generally, for half an hour, repeating his single shrill call-note, and probably wondering what the stranger meant by trying to answer that clear, loud cry. As there was never any other reply call, and he was not joined by a mate, I concluded that there must be a nest nearby, on which his silent partner was sitting. One afternoon I passed the big Vesi and noticed a parrot alight on a dead stump in the midst of an extensive jungle clearing some 200 yards distant. I turned my glass on this bird and saw that after some minutes of waiting, to inspect her surroundings, she suddenly disappeared. I then summoned my artist-assistant, Mr. W. J. Belcher, and asked him to investigate the matter, I guiding his course towards the suspected nest. He reached the spot, and signalled that the bird was nesting in a hollow stump, and set about extracting, first, the eggs and, finally, after a passing native had, with a cane-knife, chopped an aperture in the base of the tree, extracted the much-protesting bird with, as Belcher said, a bite apiece. After we assured ourselves

that the parrot was an adult of the ordinary species, we gave her the freedom of the forest.

The hard-wood stump (see the figure) was about $4\frac{1}{2}$ feet high and 14 inches in diameter. Its decayed centre was hollow, and 8 inches across. It had very smooth walls, probably worn by the birds in climbing up and down, to and from the nest below. This central hole was 4 feet deep, and its bottom was covered with rotten wood, small chips and a feather or two. On this primitive nest lay three nearly round, dirty brown eggs, which, when washed, became uniformly white. They measured one and three-sixteenths by one and three-eighths inches (30 mm. x 34.5 mm.), and each held an embryo not one-fourth developed. It must be remembered that August is a spring month below the equator and a breeding season for many a Polynesian species.

If there had been an attempt to construct any sort of nest in the hollow tree just described, there was no indication of it. Undoubtedly, the Parrots were content with the humus and wood debris that had accumulated at the bottom of the hole. Nor was there any external evidence of removal by the birds of detritus from the interior of the stump itself, such as I have observed on the ground below the nests of parrots of another genus.

For the information of such of your readers who are not familiar with Fijian ornithology, let me say that all the four species of *Pyrrhulopsis* found in Fiji are peculiar to that group. *P. splendens* is, to my mind, the most attractive of the genus: a magnificent species, whose length is 18 to 20 inches, with the head and all the upper surfaces crimson; across the nape a wide and deep blue band, back, rump, upper-tail coverts and wings bright green; primaries and their coverts, as well as the outer secondaries, blue, and, lastly, as a striking contrast, deep yellow or orange eyes. It is a question whether this species was not at one time confined to Kandavu, and whether those individuals found on Viti Levu, for example, were not introduced from the former island. Be that as it may, wild examples are rare outside Kandavu; on the other hand, they are the favourite cage birds in Fiji, because of their talking powers, their display of intelligence and affection, and because they practically never scream or make other disagreeable noises when in captivity. Although their rather shrill monotone is one of the commonest sounds to be heard in the Kandavu jungle, I have never known any of the many caged birds I have seen in Fiji and elsewhere repeat those shrill cries, that seem to be reserved for the forest only. They are fair talkers and whistlers, but in exhibiting these accomplishments, again, do not make themselves a nuisance to the neighbourhood, as do some of the other large Parrots. In other respects they conform to the habits of the true Parrots.

The theory that *P. splendens* was originally confined to the main island of Kandavu is strengthened by the fact that none of



Stump containing nest of the Fijian Crimson-breasted Parrot

Photo. by Dr. Casey A. Wood, F.Z.S., R.A.O.U.



the species has been found, so far as I could discover, on the neighbouring islet of Ono, separated from it by a narrow strait and geographically part of the small group. There appears no physical reason why the Parrots of Kandavu should not find suitable feeding and nesting resorts on Ono. The natives, however, understand. When the aboriginal gods and spirits held sway over the islands of Viti, a pair of crimson-breasts lived happily there until, one day, they discovered a secret known only by the spirits of the air, who, in those days, had charge of all the birds. These gossiping Parrots, instead of keeping it to themselves, immediately flew over to Kandavu, and, speech being easy to them, spread the tale among the denizens of the jungle. In consequence of this scandalmongery, all Parrots were forbidden by the aerial powers to live on Ono, and it has since then been of common knowledge that any that flew that way died shortly after arrival. "And that," said my Fijian informer, in a tone intended to carry conviction, "is the reason you will never, never see a Kaka on Ono."

So far as my observations have gone, I have not seen any constant differences in the sexes of these Parrots, nor any marked plumage differences between immature birds and adults. However, I am inclined to attach some importance to two characters which may differentiate them, *viz.*, size, especially length, and shape of the head. Adult females usually have *rounded*, adult males *flat*, crowns; also, the hens are somewhat smaller birds than the cocks. But this dictum calls for further confirmation.

Finsch (*Birds of the Challenger Expedition*, Zoology, Vol. 2, 1881) says the eyes of the adult male are sometimes yellow, sometimes orange; in the female, always yellow, but my impression is that the amount blended with the yellow is a purely accidental condition, due to age and other fortuitous circumstances. Bahr (*Birds of Fiji*, *Ibis*, April, 1912) has drawn attention to the fact that nestlings have brown eyes, changing to the adult yellow when they are six months old.

Until fifteen years ago, the Samoans were in the habit of making excursions to Fiji to shoot Kakas and other birds of bright plumage that they might weave the feathers into their mats. It was also said that they were not averse to buying live birds that they might pluck regular crops of feathers from the unfortunate Parrots. This cruel practice continued until the arrival, as Governor, of that sympathetic and accomplished naturalist, Sir Everard im Thurn, who put an end to the scandal. Now, the export of birds to Samoa is strictly forbidden by law, an ordinance that has the hearty support of public opinion.

The food of *P. splendens* consists entirely of soft fruits, many of which grow wild in Fiji. Unfortunately, he prefers the bananas, papaws, mangos, and some other fruits valuable to the white planter, whose hand (and gun) is often raised against

him. The chief crime of which the Parrot is accused is that of pure wastefulness; he spoils more than he eats, says the planter, eating a hole in the skin of many bananas in the bunch out of pure wantonness.

My own belief is that *P. splendens*, being a highly intelligent bird, merely samples the various fruits before deciding which one he will choose for his meal, a method not infrequently adopted by so-called higher animals!

Why take the first "mummy-apple" when the garden provides so many more, any one of which may prove to be the choicest? At any rate, Kakas are specially excluded from the long list of protected birds, as set forth in Ordinance No. XVIII., 1915, Act of the Fiji Government. That is, doubtless, one of the reasons they are relatively so rare on those islands where Europeans are numerous.

Several methods of capturing the Crimson-breasted Parrot are employed by the natives. As the main object is to secure young subjects—since these command the highest prices in the Suva market—the trapper watches the roosting trees until he discovers a nesting hole,* generally 30 to 40 feet from the ground, uniformly placed at the junction of a decayed branch with the parent stem. As he is well acquainted with the breeding habits of the species, about the middle of August he climbs to the nest and makes a shrewd calculation as to the proper time to move the fledglings (never more than three) to his own hut, that they may be brought up by hand, tamed, and educated. Nestlings properly treated are easily taught to speak, whistle, imitate various sounds, and to play with those whom they like. A young bird, even when full-plumaged, shows his age with fair accuracy by the amount of grey or white at the base of his otherwise black upper mandible. When the beak becomes entirely black one knows he has to deal with an old and probably undesirable captive; for the mature Parrot, captured and caged in the adult stage, always remains wild, untamable and intractable. Another method of taking wild Parrots is to catch them in traps. The usual plan is to utilise for the purpose a fish-creel or lobster-pot, in the manufacture of which the Fijian is an adept. This contrivance is baited with a few bananas, coconuts, or other fruits, and placed within the known feeding area of the birds.

The young and inexperienced Parrots—very few old ones are caught by this method—cannot resist temptation, and having entered the creel, rarely find their way out again. The pre-war price of a pair of young (September) birds in good plumage was from four to six shillings; at present they bring about twice that

*I have heard that the nest is sometimes built on the clumps of bamboo tops, but I have not been able to verify this statement.

amount. Strangers, on "steamer days," and especially Americans, are charged "as much as the traffic will bear." It is to them, also, that the "bad," old, or untamed Parrots are generally sold.

As long as the mongoose, mynah, "civilisation," and other enemies that have made such disastrous inroads on the bird population of the other islands continue to be excluded from Kandavu, *P. splendens* and other beautiful animals will continue to delight the zoologist, just as its tropical vegetation, charming mountain scenery, and barrier reefs compel the admiration of the occasional visitor.

The Crested Bell-Bird

By AMY BAESJON, Balladonia, *via* Norseman, W.A.

Communicated by Major E. A. Le Souef, B.V.Sc., Vice-President, R.A.O.U., Zoological Gardens, Perth.

The home of the Crested Bell-bird (*Oreoica gutturalis*) is in saltbush and lightly timbered country of the Eucla district of Western Australia, near Balladonia, about a hundred miles north of Israelite Bay, between two and three hundred miles south of east from the Gold Fields, and three hundred miles from the South Australian Border at Eucla.

These Bell-birds build in September and November, and make their nests either in young gumtrees or in the tops of hollow stumps—usually no more than four feet from the ground. The outer part of the nest, when built in trees, is composed of small sticks, and lined with bark from dead trees. In the case of stumps, however, the nest is made entirely of bark. As the eggs are laid, the birds gather a number of hairy caterpillars and carefully pinch them up and down with their beaks. They do not kill them, however, and the caterpillars sometimes begin to crawl away, whereupon the birds often catch them again and indignantly poke them into the cracks of the stump. The only soft lining the nest has is the "hair" which is rubbed off the caterpillars.

When the young ones come out—a fortnight after the eggs are laid—they are fed upon the caterpillars which are in the nest, and from then on the parent birds are kept busy. I was able to watch this pair of birds fairly closely. At first they were both very shy, but after the chicks came out, the male bird took very little notice of me. His mate, though, came near the nest only once, and though her bill was full of caterpillars, she flew away the instant she caught sight of me; I never saw her at close quarters again. She used to gather the caterpillars (this pair did not seem to feed their chicks

on anything else), and hand them over to her mate, who would bring them to the chicks. He always approached the nest and always left it in precisely the same way. The nest was beside the road, and there was a small burnt patch of ground about fifty yards away, where the birds gathered most of the caterpillars. He would drop to the ground on the opposite side of the road, hop across to the foot of the stump, scolding with his "Tut-tut-tut!" the whole time. Then he would hop from branch to branch of the few suckers which grew around the stump, always choosing the same branches, and finally into the nest, where he fed his chicks. Then he always flew to the same dead stick about four yards away, where he would sit and preen his feathers for a while, and then fly off in search of more caterpillars. He was very regular, feeding his chicks about every twelve minutes.

One day, a large black lizard heard the young Bellbirds, and soon made his way to the foot of the stump. Just as I was about to rescue the chicks, the Bell-bird returned, and growled, "Tut-tut-tut." Whereupon the lizard retired beneath a fallen log. The Bell-bird fed his chicks, then made his way to the lizard, and, putting up his crest to its highest and ruffling all his feathers till he looked a perfect ball of fury, he pecked at the lizard, and gave him such a bad time that the lizard found it was all he could do to gain the shelter of a hollow tree some yards off. Then the Bell-bird flew to the highest point of a dead tree near me, and it was then, for the first time, that I discovered what he really was, namely, a Bell-bird. For up to then I had never seen a Bell-bird—though their beautiful song is familiar enough. He began to sing now—very softly, deep and low; then he gradually got louder and louder, and his bill opened wider and wider, and his throat trembled, as though it was an effort to produce this wonderful sound. But it is the accompanying sound which seemed to come from further down his throat, as it were, that was most beautiful, and most bell-like. The whole song was certainly one of the most beautiful I have ever heard. When he reached the limit of his loud notes, he stopped, and began again on the soft notes. From the distance, this day, his mate answered him, and she seemed to have as sweet a voice as he.

When the young ones first came out they were covered with brown down, about as scant as the hair upon the caterpillars they fed upon. In two days pin-feathers appeared, and a few days after they were covered with brown feathers. In a few more days they flew away—a little over a week from the time they were hatched. As I have noticed with all the wild birds of this part, the parent birds take their chicks right away from the nest as soon as they are able to fly, though they continue to feed them for some time.

Birds of the Broome Hill District.

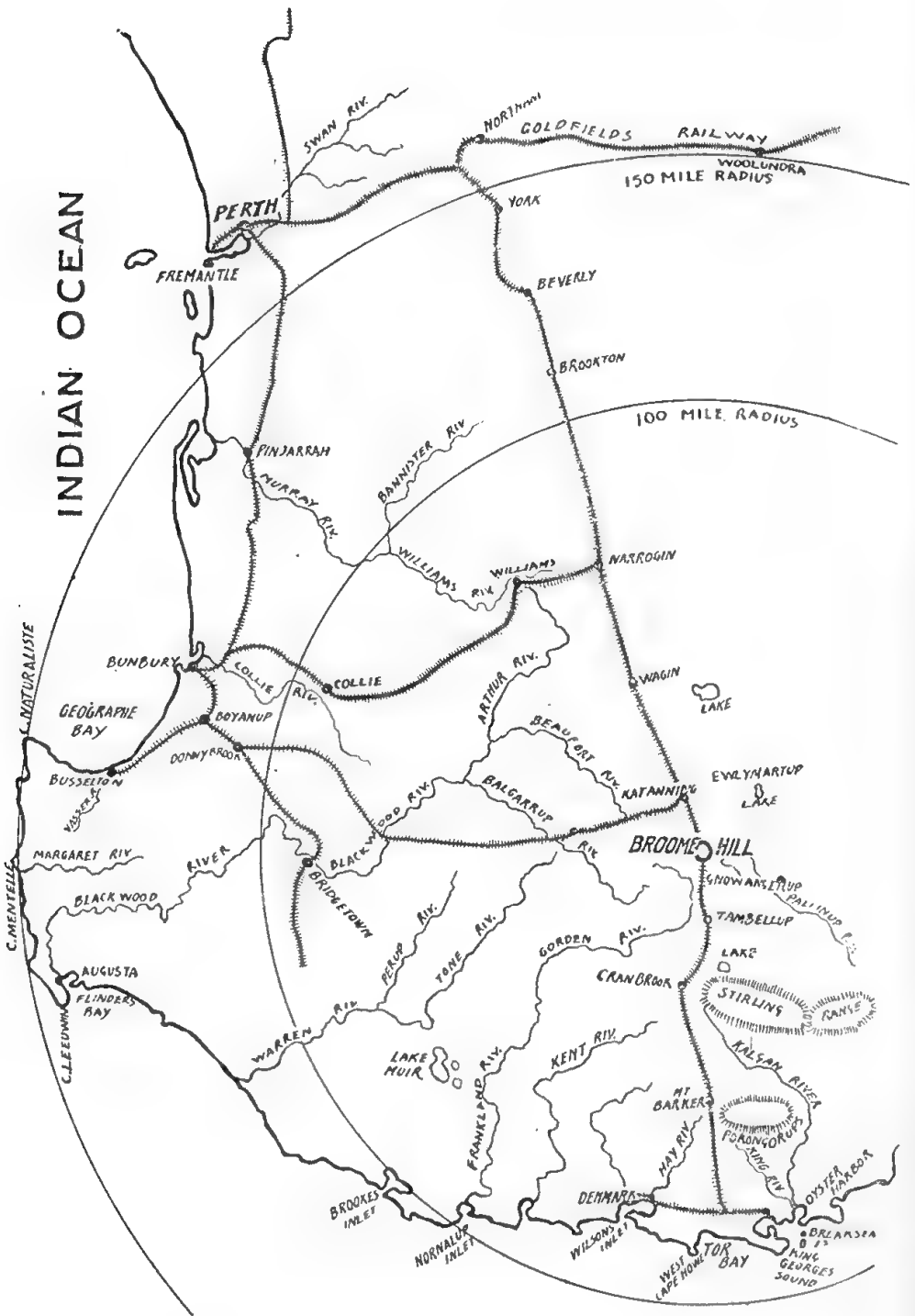
By TOM CARTER, C.F.A.O.U., Sutton, Surrey, England.
Part I.

Having resided at Broome Hill for nearly nine years (April 6th, 1905, to December 10th, 1913), and also having revisited that locality and other districts in the south-west corner of Western Australia on several subsequent dates, including the year 1922, I obtained a good knowledge of the birds resident and breeding there, and also records of several stray visitants. I now publish a list of them, with field notes on one hundred and ninety-seven (197) species or sub-species, which is seventeen more than were included in my "Birds of the North-West Cape," *vide Emu*, Vol. 3, 1903-4. Some of the following notes have already been published in *The Emu*, *The Ibis*, and Mathews' *Birds of Australia*.

Broome Hill is a small township on the Great Southern railway, about 160 miles south-east from Perth, and about eighty (80) miles north of Albany, measuring straight by map, or 237 miles by rail from Perth, and 104 miles from Albany. The country parallel to the above railway averages about one thousand feet above sea-level, Broome Hill being 1073 feet. The air is generally clear and dry, and nights quite cool, even after a few days of heat in summer, when the thermometer sometimes rises to 108° Fah. in the shade. Quite sharp frosts were experienced at Broome Hill during the winter months, and occasionally even as late as Xmas. On August 30th, 1908, there was a cover of snow in the early morning, when snowballs were made; several further heavy falls of snow occurred during the day. Old residents said they had never previously seen such a downfall, but a still heavier fall occurred there some years after I left that district. Taking the climate all round, I should describe it as liable to sudden changes, and as rather trying occasionally. The rainfall varies from about 14" to 22" per annum, averaging about 18".

The surrounding country, in its natural state, is mostly well grassed, and lightly timbered, as compared with the coastal south-west forest country. The prevailing trees are White Gum, York Gum, Yate, Morrell, and Flooded Gums along the creeks. There is also much "Jam" (*Acacia acuminata*), small trees, whose wood is invaluable for fencing posts, etc. Jarrah and Red Gum trees, that prevail in the coastal districts, find their eastern limit at Broome Hill, about the railway line. East of the railway, the country changes to patches of smaller *Eucalypti*, mostly of the "Mallee" varieties, with immense areas of Ma-lock, other scrub, and open scrubby "sand-plains."

Some of the head-waters of four large rivers rise near Broome Hill. The Gordon River (which is called the Frankland, in its lower reaches) has tributaries a few miles to the west, with permanent deep pools; it eventually reaches the Southern Ocean



Map of the South-west of Western Australia.

at Nornalup Inlet, about ninety miles south-west. The Balgarup Creek, a tributary of the fine Blackwood River, the largest river in the south-west, also has its source to the west of Broome Hill, reaching the sea at Augusta, 150 miles west. The headwaters of the Warren River are close to the Balgarup Creek. On the east are creeks that form part of the Pallenup, or Salt River, that empties into Beaufort Inlet, 80 miles to the south-east. The fine Stirling Ranges, with their bold, rugged peaks up to 3600ft., run east and west for about forty miles, at a distance of about thirty miles south from Broome Hill. Rather curiously, this fine range is almost devoid of springs or pools of water. A smaller range of rough hills, called the Porongorups, is situated about ten miles south of the Stirling Ranges.

Dromaius novæ-hollandiæ. Emus were not plentiful about Broome Hill, but were occasionally seen. As the district became more settled, and wire fences were erected, these birds naturally retired to localities still "unimproved," such as the denser forests to the south and west or the more open sand plains to the east. A pair of adults was seen by me in a lane outside one of my boundary fences on April 13, 1905, that were evidently "bushed," and did not know how to get out of it. Another was in a neighbour's paddock in March, 1906. A good many were seen in March, 1910, near Denmark (about forty miles west of Albany) in the great Karri forests there, where the undergrowth consisted largely of Bracken Fern, often four to six feet in height. I also noticed in the same year that many frequented the open country on the south side of Albany Harbour, and drank at a large freshwater pool there. A neighbour told me, in September, 1911, that Emus were then laying their eggs in the sandplain scrubs, about fifteen miles east of Broome Hill, and in December, 1911, a farmer in the same locality told me that Emus still had eggs there. (The rainfall was much below the average that year.) In August, 1912, a nest containing five eggs was found about thirty miles to the west of Broome Hill, and a party of five Emus was seen. I was told that these birds bred regularly then in that locality. In January, 1916, when I was visiting Lake Muir, about seventy miles south-west of Broome Hill, some Kangaroo and Dingo-hunters shot a large, and very fat, Emu in order to feed their dogs on the meat. A good many Emu were seen on that visit, and also on several other visits. Emus are not popular birds in the south-west coastal areas, as they eat the large seeds of the interesting Cycad, the Zamia Palm (*Macrozamia*), and voiding some of them undigested, spread this noxious plant to fresh places. Cattle also eat the seeds, which cause paralysis, or a form of "Rickets," in their hind quarters.

Leipoa ocellata. Mallee-Fowl or Mallee Hens, as they are generally called in Western Australia, and sometimes Gnows (which is the aboriginal name) were plentiful near Broome Hill in 1905, especially in the ma'lock scrubs east of the railway. About that time a "boom" set in, and now practically all that country for thirty (30) miles or more is utilised for growing wheat, and for mixed farming; there is a thriving township at Gnowangerup, twenty miles out, through which runs a branch railway line off the Great Southern Railway, to another smaller township, twenty miles further east. The name Gnowangerup signifies in the aboriginal language, the abode, or place, of Mallee Fowl, so these birds evidently abounded there in past ages, and, no doubt, the blacks

regularly camped there to obtain the eggs. In February, 1919, I saw many birds near the town, and on February 16th I flushed two half-grown young. Adult birds were seen in close proximity to a friend's house, and one was feeding with his fowls. I was also there in March, 1922, but saw only one Gnow, although I daily walked many miles through still virgin sandplain scrub. However, these fine birds are still numerous in the coastal scrubs, about sixty miles further to the east. In 1910, a Government land surveyor, working in the above district, remarked to me how abundant these birds were in the then dense scrubs, and that while "running" a survey line, it once passed directly over seventeen egg mounds within a length of one mile. It was a common thing for the settlers of the south-west to collect eggs from the mounds regularly for eating purposes, and I have been shown "nests" in different places from which I was assured that eggs had been so taken for twenty years or more. A few pairs of Mallee Fowl regularly nested near Lake Muir. In November, 1902, I examined a nest near Cape Mentelle, which was being prepared for the eggs, and a fortnight later I knew of several eggs having been taken from a nest farther north on that coast. At that time Mallee Fowl were not uncommon in the coastal scrubs between Cape Naturaliste and the mouth of the Warren River (about 100 miles apart), and a few still occur there, the diminished numbers being caused mostly by burning off the scrub to improve the grazing for cattle. In March, 1916, a fine male bird was shot on the Lower Blackwood River, and its body served as the "piece de resistance" for dinner at the local hotel, and it was excellent eating.

Coturnix pectoralis. Stubble Quail were fairly plentiful on cultivated land about Broome Hill, breeding in November and December in the standing crops. Dec. 1/07, twelve eggs in nest, much incubated; Dec. 8/07, another nest with eleven eggs; Nov. 17/08, six newly hatched young seen in a neighbour's crop; Nov. 20/10, half-grown young seen, also on Nov. 27/11; Nov. 22/12; two broods of young seen, about quarter- and half-grown respectively; Nov. 22/12, also a nest with six eggs, nearly hatching, and one fresh egg laid just outside the nest.

Synoisicus australis. Brown Quail were not observed in the vicinity of Broome Hill, but were not uncommon further south and west, where moist and swampy country was plentiful.

Turnix varia. Painted Quail were common about Broome Hill. They were often heard calling near my house, until late in the night, and the following notes were made:—Oct. 23/06, a nest with four fresh eggs; July 16/07, first heard calling that year; Feb. 8/08, some calling; Oct. 20/07, recently hatched young seen; Nov. 2/07, fresh eggs (4) in nest; Sept. 20/08, my dog killed one of a recently fledged brood; Oct. 4/08, flushed a party of two adults, and four half-grown young, that flew strongly away on a stony range; Oct. 10/08, found a nest containing four slightly incubated eggs in a patch of short rushes; a few dry rushes made the nest; Aug. 27/10, obtained a female with half-developed eggs in ovary; Oct. 17/11, small young seen; Oct. 7/12, four adults seen, the first this year, when they were scarce; March 4/13, a nest containing one egg was found in a tussock of grass, and kept under observation as follows:—March 5, still one egg; March 6, two eggs, bird was on the nest; March 7, two eggs, which were cold—no bird was seen; March 8, two eggs, bird on nest, and another seen close to it; March 9, three eggs, bird not seen, but eggs warm; March 10, bird sitting on three eggs; March 23, eggs hatched and birds gone; Jan. 16/16, recently fledged young seen.

Geopelia cuneata. Diamond Doves.—Mr. J. Higham told me that he saw many of these Doves in 1917, about the Williams River (60 miles north of Broome Hill).

Phaps chalcoptera. Bronzewings were common about Broome Hill, probably on account of so much "Jam" (*Acacia acuminata*) timber in that district, the seeds of which are a favourite food of these Pigeons. As these small trees yield the most durable wood for fencing posts, and are being cut down wholesale for that purpose, these fine birds are now much scarcer than they were. They breed mostly in September and October, and choose varied nesting sites. Sept. 4/10, the male bird was sitting in a lightly-made nest with two eggs, slightly incubated, about ten feet from the ground in a she-oak tree; Sept. 23/10, found a nest about five feet up in a small "Stink-wood" tree. There was one egg in the nest, and the other on the ground below, broken. This seemed to be due to a Lace Lizard. There was another nest about twenty-five feet up in a she-oak tree about one hundred yards distant; Oct. 12/10, a male bird came out of the hollow spout of a large white-gum tree; climbing up to the place, about twenty feet above the ground, I found two eggs on the decaying wood about two feet down the broken hollow branch; Jan. 16/16, recently fledged young seen at Broome Hill. These birds get very tame near a house, if not molested, and I have seen several of them feeding on grain with domestic fowls.

Phaps elegans. Brush Bronzewing Pigeons were fairly numerous in the south-west coastal districts, which they prefer to inland. They were fairly common on the lower part of the Pallinup River. Like the Bronzewings, they drank about sundown, and also had the habit of walking on open highroads about that time, as I have frequently observed, particularly on the Busselton-Quindalup road, where there is considerable traffic.

Hypotaenidia philippensis. Buff-banded Landrails were occasionally seen about the Vasse River, but they are easily overlooked on account of their seclusive habits.

Porzana plumbea. Spotless Crakes were not observed near Broome Hill, where there are no densely timbered swamps, to which these birds are so partial, and which abound through the more coastal districts. They were plentiful in the large freshwater swamps, "Tordit-gurru," Byanup, and others, that almost join the brackish waters of Lake Muir. Domestic cats destroy many of these birds, as, when visiting the homestead at Lake Muir, the house cats there on several occasions and also at other places, brought in birds they had caught. Jan. 21/16, several young birds, about half-grown, were seen at Lake Muir.

Tribonyx ventralis. Black-tailed Native Hens occurred at Broome Hill, and the South-West, in a sporadic way; no doubt, their visits there were caused by lack of water in their usual haunts further inland. June, 1907, a single bird was seen at a stock tank, and was afterwards joined by other stragglers until there were twelve of them; they remained until October. Oct. 26/08, two were seen for that day only at the home stock tank; Sept. 25/12, one was seen at the first mentioned tank, and also a good many at a large Roads Board tank near the township, where they remained until November, 1917; March 14/13, a pair were seen on the Pallinup River; April 17/19, great numbers suddenly appeared on the Vasse River, where residents said none had been seen for fourteen years. Three birds that I shot were in good plump condition. There was an extensive irruption of these birds in 1919, as in the second week of May they swarmed on the artificial lakes in Perth (Queen's Gardens and Hyde Park) for a few days only, and in the following week I saw a great many about Woolundra (120 miles east of Perth).

Gallinula tenebrosa. Black Moorhens occurred at the permanent pools of the Gordon and Pallinup Rivers, near Broome Hill, but were more plentiful in the coastal swamps. They were particularly numerous in swamps near the lower Warren River, which Mr. J.

Higham and myself visited in March, 1919. Mr. W. B. Alexander wrote an interesting paper on the "Changes in Color of the Bill of the Black Moorhen," from Warren River specimens. (*Vide* "Emu," Vol. 19, p. 58.)

Porphyrio bellus. Blue Bald-Coots (Swamp Hens) were fairly common along the pools of the Pallinup and Gordon Rivers, and also in all swamps. They were numerous with many half-grown young birds in the freshwater swamps adjoining Lake Muir in December, 1911. (The water in Lake Muir is brackish, and becomes saltier as the water gets lower.) Aboriginal name, Gordon River district, Moo-lah.

Fulica atra. Coots were seen occasionally on the Pallinup and Vasse Rivers, and several small parties at the mouth of the Warren River in March, 1919.

Podiceps ruficollis. The Little Grebe was the most common Grebe throughout the South-West, and occurred on all waters. They nested regularly on the home stock tank. This tank was about twenty-five yards square, but doubled its area by overflowing its edges after heavy winter rains. The Grebes usually appeared on the above and similar tanks as soon as they overflowed the square, and left them when the water was in the square only. The following notes apply to the tank at the homestead:—Oct. 28/05, a nest containing eggs; Sept. 12/06, a pair arrived and built a nest that had two eggs early in October, but the female bird disappeared soon afterwards, leaving the male alone, and he did not attempt any incubation, but remained until Dec. 24, when two other Grebes joined him, that were either females or full-grown birds of the year; the following day all three Grebes had gone; Oct. 9/06, a nest with two eggs; Aug. 2/07, two Grebes came to the tank, and made a nest, that had five eggs on Oct. 20; July 13/08, a pair came on tank and built a nest, that had eggs Aug. 16, which hatched in early Sept., and on Oct. 19 a second nest contained eggs, so that on Nov. 21 four half-grown young birds in striped plumage were swimming on the tank with three recently hatched young of the second brood, and the two adult birds; they fed largely on small water beetles. As I was in England most of 1909, I missed notes for that year, but on Jan. 3/10, two adults and two young birds were on the tank, the latter birds still having striped heads. July 8/10, two adult birds appeared and built a nest that contained eggs on Sept 5. On Sept. 14 I waded out to it, and found one egg, apparently forsaken, I think, because a dog had been splashing about the nest a few days previously. However, the birds built another nest, about twenty yards away; it contained three eggs on Sept. 19. Young birds hatched from this on Oct. 13, the incubation period having been twenty-three (23) days. On Nov. 29/10, while I was near the stables (about 150 yards from the tank), one young bird flew strongly from behind me (apparently having been perched in one of the several trees that grew there), alighted on the ground a few yards from me, so that I had a good view of it, and then again flew strongly over the tank, and taking a long circle beyond it, came back and settled on the water. Dec. 6/10, the old birds left the tank, as the water was down to the square, leaving the young birds there for a few days, then the latter went to a small pool (or dub) in the creek, about 300 yards distant, where they remained for three days, and then came back to the tank, which they finally left on Dec. 22nd. Oct. 7/11, a single bird was on the tank for a few days, the only one observed this year, as the rainfall was below the average, and the tank water did not rise over the square. Sept. 7/12, the tank flowed over the square, and two Grebes were seen on it Sept. 25, and reared a brood of young, which were well-grown by Nov. 18. Jan. 14/13, the above birds built a second nest near the tank



Masked Wood-Swallow on right top of dead tree.
Young Stone-Plovers on door-mat.

Author climbing to nest of Bell Magpie
Little Penguins

1871

overflow, but, as the water receded with hot weather, the nest was left almost dry. One young bird hatched out on Jan 14, but was killed by black ants swarming over the nest, so I moved it further away from the land so that it was again surrounded by water, but no more eggs were hatched, and the old birds left the tank Jan. 30. Little Grebes were numerous in the freshwater swamps and lakes at Lake Muir, and other South-West localities, where this is the commonest Grebe.

Podiceps poliocephalus. Hoary-headed Grebes are not nearly as common in the South-West as the preceding species, but it is difficult to identify either of them with certainty when they are some distance from land, especially in the non-breeding season. These birds were numerous on the Vasse River in April, 1919.

Podiceps cristatus. Crested Grebes were seen occasionally in Albany Harbour. A small party of them were seen on Lake Muir in March, 1919; they kept a long way out on that large sheet of water (7 miles by 4 miles), so it was not possible to be sure if they had tippets or not. Mr. A. F. H. Muir, who has resided there for many years, said that these birds were seen there a long time ago, then the Lake "went dry" for several years, and the next year when he saw any was 1918, when the Lake was fuller than ever known before, although that was one of the driest years ever known in that locality. It was very extraordinary.

Eudyptula minor. Little Penguins may seem out of place in this paper, but Breaksea Island, ten miles from Albany, is not one hundred miles from Broome Hill, and these birds breed regularly on that island, and other smaller ones in King George's Sound, most of which I have examined for bird life. Dec. 15/08, Eggs, much incubated, were observed at Breaksea; July 16/10, Little Penguins were seen in their nesting holes at Breaksea; Oct. 8/10, many freshly laid eggs were seen there; the lighthouse-keeper on Breaksea kindly sent to me at Broome Hill a pair of full-grown birds, that I kept for some weeks. (Note in "Emu," Vol. X., p. 137.)

Puffinus pacificus. Wedge-tailed Shearwaters were obtained near Albany.

Puffinus carneipes. The Fleishy-footed Shearwater seemed to be the main Petrel breeding on Breaksea Island, where the numerous rabbit holes make good nesting places for them and Penguins. Most of the eggs are laid in November. On December 22/10, I obtained two female *P. carneipes* that had finished laying.

Pterodroma macroptera albanii. Western Great-winged Fulmars bred on Rabbit Island, close to the mainland, outside Albany Harbour, where I personally obtained living specimens, June 24/11.

Albatrosses were numerous off Albany Harbour, and along the adjacent coasts, and I identified the following three species:— *Diomedea exulans*, *Diomedea melanophrys*, *Diomedea chlororhynchus*. No doubt others occur there, as well as other varieties of Petrels (*Procellariiformes*), Gulls (*Lariformes*), and Wading Birds (*Charadriiformes*), not mentioned in these notes.

Hydroprogne caspia. Caspian Terns were seen occasionally about Albany, and also between C. Leeuwin and C. Naturaliste.

Sterna bergii gwendolenæ. Western Crested Terns were common along the coast from Albany to Cape Naturaliste, and in March, 1919, a few were seen at Lake Muir, and a specimen taken for identification.

Larus novæ-hollandiæ. Silver Gulls regularly frequented Lake Muir, and occasionally bred there on a small rocky islet. In April, 1911, I found "all hands" at the station eating eggs of this bird, of which they had obtained several dozen. Mr. F. Muir kindly gave me a few of the eggs for cabinet specimens. He wrote to me later, saying that the Gulls were laying on the same islet in November, 1911, and also again from January to March, 1912. Many Gulls were seen there in March, 1919, When at Augusta, at the

mouth of the fine Blackwood River, March 14/16, I saw from the landing stage two Silver Gulls in one of the rowing boats, and to my great surprise one of them remained in the bottom of the boat and the other perched on the gunwale. Stepping down to investigate, I found that the Gull in the boat bottom had swallowed a baited hook on the end of a fishing line, and was also entangled in the line. I succeeded in releasing it, after a little trouble. The other Gull hovered within reach of me, in great concern, until I freed it, when they flew away together. It was a pleasing example of affection between bird mates. Silver Gulls are abundant along the South-West coast, and there is a special "Gull Rock" near Cape Naturaliste.

Gabianus pacificus. Pacific Gulls were common in and about Princess Royal Harbour, Albany, and along the coasts.

Catharacta lonnbergi. Southern Skuas were seen outside Albany Harbour in December, 1904, and on several subsequent occasions.

Hæmatopus ostralegus. Pied Oystercatchers are not nearly so common on the South-West beaches as they are north of Shark Bay, but they are not rare.

Hæmatopus unicolor bernieri. Western Black Oystercatchers are fairly common on the rocky beaches near Albany and the adjacent islands. I saw several on Rabbit Island in March, 1910.

Erythrogonys cinctus. A Red-kneed Dotterel was at the stock tank near my house (Broome Hill) on March 20, 1906. It was the only specimen seen anywhere in the South-West.

Zonifer tricolor gwendolenæ. Western Banded Plovers were plentiful around Broome Hill on the cleared, cultivated and grass land. They increased much in numbers as the timber was burnt off and the country opened out, and I find the following notes in my journal:—Aug. 15/07, about seven seen at Goblup homestead; April 12/08, about eight pairs seen at Goblup; Nov. 1/08, saw about forty in one flock at Goblup; Nov. 23/10, more than a hundred in one flock at a neighbour's water tank (these birds lay their eggs mostly in September, and, as soon as the young birds can fly, they gather into flocks); Sept. 15/10, saw three young in down, about a fortnight old; Oct. 23/10, saw young in down, smaller than the above; Sept. 14/11, found a "nest" with four eggs. There is really no nest, the eggs being laid in a slight depression, and, it may be only a chance coincidence, but eggs were several times observed in proximity to horse manure; Jan. 1/12, a few Plover seen at Lake Muir. This bird was, to my own knowledge, common to the east of Broome Hill as far as Jerramungup (75 miles), and bred there. When visiting Busselton (Vasse River), in April, 1919, I noticed small parties of these birds on cleared land, and as I had been there on many occasions and never previously seen this Plover, I asked the owner the date when he had first noticed them. He said that a few pairs had arrived a few years ago, and had soon increased in numbers. In January, 1922, a few were seen 25 miles further west close to the coast.

Squatarola squatarola, Pluvialis dominicus. Grey Plover, Lesser Golden Plover.—These birds were commonly seen in Albany Harbour, and similar situations, during summer. There was a place in the harbour, on the opposite side to the town, where a stream of fresh water entered the sea, which was much frequented by Gulls and many species of "Waders," for both feeding and bathing purposes; probably the Gulls went there mainly for the bathing.

Charadrius ruficapillus tormenti. Pale Red-capped Dotterel were common along all beaches, but not inland.

Charadrius cucullatus tregellasi. Western Hooded Dotterel were not uncommon on the beaches near Albany, but were more numerous in the vicinity of Cape Mentelle and Cape Naturaliste on the west coast, where many small parties were observed.

Charadrius melanops russatus. Western Black-fronted Dotterel occurred inland at most river pools, margins of swamps, and stock tanks. They were usually in pairs, excepting after the young birds were hatched out, when the family parties kept together for some time. A pair used to appear regularly at the stock tank near my "Wensleydale" house, and bred near it, but, according to the following notes, they were seen only during summer, and were not observed between January and October. Nov. 27/06, one seen at the above stock tank; Nov. 18/07, one seen at tank; Oct. 17/08, a pair seen at tank; Oct. 20/08, shot a female, containing fully-formed egg; Oct. 28/08, a pair at tank, so apparently the male soon found a mate; Nov. 28/09, a "nest" containing four eggs was found on a bare ironstone gravel ridge, about two hundred yards from tank. The eggs were practically on bare ground, and I took them because they were in the track of sheep being driven to and from the shearing shed; Jan. 13/10, the same pair of birds (apparently) had a brood of half-grown young at the tank; Oct. 7/10, a single bird seen at the tank; Oct. 6/12, a single bird at the tank which was joined by another a few days afterwards—(I sold my station in 1913); Jan. 8/16, several birds, evidently a family party, were seen at the tank—(my first visit there since end of 1913).

Himantopus leucocephalus, *Cladorhynchus leucocephalus*, *Recurvirostra novæ-hollandiæ*. White Headed Stilt, Banded Stilt, Red necked Avocet.—The only place where the above three species occurred near Broome Hill is about twenty-five miles to the south, near Cranbrook, where there are, in wet seasons, some lakes of considerable size, which attract many water-loving birds.

Numenius cyanopus, *Numenius phaeopus*. Eastern Curlew and Whimbrel.—The above two species were fairly common on the shallow flats about Albany Harbour, and also in the large expanse of shallow tidal water in Oyster Harbour, a little further west.

Actitis hypoleucos auritus. Eastern Common Sandpipers were seen on the edges of the Vasse River, generally singly, on several dates in January, 1888, March, 1910, and February, 1917. One was seen on the edge of Albany Harbour (Princess Royal) on January 28, 1910, and the same bird (apparently) at the same pool on several succeeding days.

Glottis nebularius glottoides. An Eastern Greenshank was seen at the stock tank at Broome Hill on November 25, 1905. Single birds were occasionally seen on the beaches near Albany.

Crocethia alba. A Sanderling was seen on the beach near Cape Mentelle on March 2, 1916, and was the only one identified by me anywhere in the South-West. They were comparatively common in the North-West Cape region during my thirteen years' residence there ("Emu," Vol. III., p. 177.)

Pisobia ruficollis, *Pisobia acuminata*. Red-necked Stints, and Sharp-tailed Stints, were occasionally seen about Albany and the southwestern beaches.

Burhinus magnirostris broomei. Western Stone Plovers were seen and heard in all districts; the following notes refer to Broome Hill district:—May 16/06, heard some calling, after months of silence; Oct. 8/07, a young bird about a quarter-grown, was caught; Nov. 3/07, while driving along a bush "road," in open timber, I saw a Curlew slip quietly off two eggs that were laid on bare ground within six feet of the road. An examination of the eggs showed them to be "chipping" for the exit of the young birds, so they were left *in situ*; both parents came within a few feet of me while I was examining the eggs; Oct. 20/07, two fresh eggs were found in a nest; Nov., 1907, a servant employed at Wensleydale told me that she once saw a Curlew on the ground beneath a wood heap, and she killed it with an axe; no eggs were seen; Nov. 18/08, two half-grown young found; Aug. 4/10, examined a female with slightly

enlarged ovaries; June 12/13, while mustering sheep, a pair of Curlews were disturbed, and ran some distance, and were "mobbed" in rather a savage way as they ran, by a party of magpies. These Curlews, when disturbed in daylight, will sometimes run some distance, and then lie flat on the ground, and occasionally they assume an unnatural rigid position, with neck and head "awry," so as to resemble a small dead stump, and in that position I have passed them within a few yards, without their moving. Jan., 1922, I saw a good many in open coastal scrubs, and also in forest country near Cape Naturaliste. Two young birds, about a fortnight old, were brought in by an employee, Nov. 18/08, and were kept on the house verandah for a few days. As it was netted all the way round, they could not get out unless someone left the gate open. The verandah was floored with jarrah boards, and two doors opened on to it from the house front. At each door was a coir door mat. Whenever anyone ascended the wooden steps to the verandah, the young Curlews ran to a mat and crouched flat on it with heads stretched out. They knew by instinct that the rough mats were the nearest approach to "cover" that they had, and their plumage blended well with the coir fibre.

Eupodotis australis derbyi. Western Bustards were seldom seen in the first few years I lived at Broome Hill, but as the country was cleared they were more plentiful there, as they always had been on the open sand-plain country to the east; Dec. 1/05, saw a large one in one of my paddocks, the first observed; May, 1911, a neighbour, who had taken up land in the then new Gnowangerup district, twenty miles east of Broome Hill, told me that "Turkeys" were common there, and several had been shot; June 5/11, a female was shot by a neighbour; it was in poor condition, weighing only nine pounds; Mar. 10/22, several fine "Turkeys" were seen on the scrubby sandplains some miles east of Gnowangerup.

Threskiornis spinicollis. A large flock of Straw-necked Ibises was seen May 7/05, on Goblup Station, that joined my land. The birds remained there until about September; April 23/11, I saw a single "Ibis" several times at Lake Muir, and Mr. F. Muir told me it had been there for a year or more, and generally accompanied some White-faced Herons; Mar. 14/13, I saw one at the Pallinup River, and also a pair there, June 5/13; April 16/19, many were seen at the Vasse River in pairs or singly, but no flocks.

Notophox novæ-hollandiæ. White-faced Herons were common in all districts. Fledgling young were seen on the Pallinup River, Sept. 26/10. They were particularly numerous about the Vasse River.

Notophox pacifica. White-necked Herons are not nearly so common as the preceding, but are generally distributed. They are not so sociable as the "White-faced," being usually seen singly. I have a note of one that I shot, Dec. 12/12, as it looked an unusually large bird. It measured forty-two inches in length, and had sixty inches expanse of wings.

Demigretta sacra. Reef-Herons are not nearly so common along the South-West coasts as they are in the North-West, but occasional birds were seen about Albany. Cape Leeuwin and Cape Naturaliste. The only white variety of this bird that I saw in the South-West was one that Captain Winzar, then Harbour-master of Albany, kindly forwarded to me as a rarity.

Demigretta sacra carteri. The type of the Leeuwin Reef Heron was shot near Cape Leeuwin lighthouse, on April 9. 1919, by Mr. J. Higham, who was with me at the time. As it differed from any other Reef Heron I had previously seen, I sent it to Mr. Mathews, who described it as above.

Nycticorax caledonicus. Nankeen Night-Herons were not seen at Broome Hill, but occur along all the south-west rivers. They were most frequently seen on the Vasse, and in February-March, 1916, they were there in hundreds, and the residents along the banks said they

had never previously seen so many, and were puzzled by the immature birds in their spotted plumage. None was seen when I visited the Vasse in April, 1919, but I noticed a few there in December, 1921.

Dupetor flavicollis. Black Bitterns were occasionally seen along the Vasse River, and in other south-west localities, but were not common.

Botaurus poiciloptilus. Brown Bitterns occur in all swamps and along the rivers, but, owing to increased settlement, they are not nearly so numerous as they were fifteen or twenty years ago.

Chenopsis atrata (Abor. "Marlee"). Black Swans seem to "hold their own," and are still abundant in many districts where Lakes occur, as near Wagin, Cranbrook, Augusta, and the tidal estuaries of rivers; also in several sea inlets that occur along the south and west coasts. When residing at Broome Hill, it was a common event to hear the musical notes of Swans flying at night towards Lake Ewlymartup, and other large sheets of water to the North-East. They were often seen in Albany Harbour, and I have a note that, on February 16, 1905, I counted more than sixty there. Black Swans could be seen in hundreds at Lake Muir, whenever there was sufficient water for them. April 24/11, I came upon thirty-six Swans' nests on a low ridge, about twenty yards from what had been the edge of the lake, but the water had receded and left the nests quite dry. Each nest contained from three to five eggs, excepting two, which held six and seven eggs respectively. I examined several of the eggs, and found that most of them contained young, almost ready for hatching, but, of course, putrid. Four eggs were "addled." Upon enquiring about this desertion of nests, Mr. Muir told me that the eggs were laid in October, 1910, when the lake had filled with water, after being dry for some years. Just about the time when the young birds should have hatched out, a heavy gale of wind occurred, with much rain, and the lake washed over the nests, with the above result.

Anseranas semipalmata. Only one Pied Goose came under my personal observation. On Nov. 1, 1905, I walked to within five yards of one at my Broome Hill stock tank. It was evidently resting after a long flight, and flew away within an hour of my seeing it.

Nettapus pulchellus. Green Pygmy-Goose. Although I never personally obtained this Duck, I know that some were shot at Lake Muir on Dec. 8, 1911, and others were obtained by a party of Duck-shooters at Lake Ewlymartup, about twelve miles north-east of Broome Hill.

Chenonetta jubata. Maned Geese or Wood-Ducks were not uncommon at Lake Ewlymartup and other suitable localities in the south-west corner. April 10/08, a stray one was on my stock tank.

Tadorna tadornoides. The Chestnut-breasted Shelduck (or Mountain Duck, as it is generally called in Western Australia) is the commonest Salt-water Duck, occurring in all estuaries and tidal inlets. Large numbers were often seen in the Albany Harbour. As this fine sheet of water is about two miles wide, and five miles in length, the Ducks are well able to keep out of gunshot; but the greatest numbers I have seen was on Lake Muir, where there are thousands when the lake is full, and their loud "honking" notes can be heard a long way. As this lake is quite open, with the exception of a few small islets, it is not an easy place to obtain any birds. A shot may be obtained at a few ducks in a little sheltered bay, but at once there is a roar of thousands of ducks' wings from all parts of the lake, and the birds congregate for some time in the centre, far out of gunshot. Few Mountain Ducks were on this lake during March, 1919, probably because there was more water in it than ever previously known, and the water was almost quite fresh, Mr. Higham and myself using it for making tea. It is usually quite brackish, and gets saltier as the water lowers. The unusual fulness of the lake early in 1919 was a puzzle to the

residents (who are comprised in two families of the ever-hospitable Muirs, who have each a station on opposite sides of the lake, and are the pioneers of that district), because 1918 was one of the driest seasons known in that area. There are no watercourses of any size entering the lake, and when it is dry its bottom is flat and even, without any signs of springs of water bubbling up. In January, 1916, Mountain Ducks were plentiful on Lake Muir, and the water not very high, but very salt; a few were often seen on the lower (tidal) part of the Vasse River; young in down were observed there on Nov. 4, 1902; Dec. 10, 1911, I examined an old nesting site in a large green Yate tree, near Mr. F. Muir's oatfield. The nesting cavity was six feet in length, downwards, and was thickly lined with ducks' down. Mr. Muir told me he had taken twelve eggs from it a few weeks previously. The tree was about half a mile from the lake.

Anas superciliosa. The Grey or "Black" Duck was the commonest Duck around Broome Hill. Nov. 7/05, small young in down at the tank near my house; Sept. 15/06, found a female lying dead with a broken neck, having evidently flown against a wire fence—it contained eggs almost ready for laying; Nov. 2/06, saw small young in down; Nov. 26/06, saw at my stock tank a brood of well-grown young that could fly; Sept. 22/07, found a nest with eight eggs, that hatched about Oct. 17; Aug. 16/08, found a nest with egg shells from which the young had already hatched, on a sandplain with low scrub, four miles east of Broome Hill; this nest was a long way from any water; Oct. 21/08, saw a brood of young about three-quarters grown; Sept. 17/10, a nest with eight eggs in one of my paddocks; Oct. 4/10, saw half-grown young that could fly a short distance; Oct. 28/10, saw a brood of twelve young about two days old; July 25/12, found a nest with ten eggs; Oct. 20/12, saw small young in down about three days old; Dec. 17/12, found a nest in one of my paddocks from which the young had gone, under a very prickly and dense bush, that should have been a great protection from bush enemies; the nearest water was a mile distant. For several years a Black Duck laid its eggs and reared the young in a nest in the hollow "spout," about twenty feet up a large White Gum tree, about 200 yards from my house. I never saw how the young came to the ground. Jan. 29/16, I saw a brood of nine young in down, only a few days old, at one of the freshwater swamps close to Lake Muir, and Mr. F. Muir found two other similar broods at another swamp the same week. They were evidently second broods. The Black Ducks that frequented the house stock tank used regularly to walk up to the stock yards (150 yards distant) at evening milking time, and pick up grains of corn, etc., off the ground, walking underneath the cows, with a man milking within a few yards. One duck regularly fed from a box with a sick ram that was given rations of chaff. Some visitors whom I took to see this interesting sight, would not believe that the ducks were really wild ones.

Virago castanea. The Chestnut Teal was the second most numerous species of Duck occurring at Lake Muir. They also occurred on the Pallinup River, whose waters are decidedly brackish when the river has ceased running in summer. I took a breeding male there on Sept. 17/10. A few have also been seen on the lower Blackwood River near Augusta, where the water is affected by the tides. I have examined in the flesh some of these ducks that had been recently shot there in March, 1916. I observed none of these Ducks on Lake Muir in March, 1919, when the lake was larger than ever known, and the water was fresh. This lake was very low when I was there in 1916, as I had a talk with a shooting party who had just shot six of these Teal in a freshwater swamp, that was only about two hundred yards from the Lake, and ran into it. I enquired

if it was a common occurrence to find these Teal on fresh water, and was told that it was not, but in rough, windy weather some of them leave the lake, which is quite open and devoid of rushes, etc., in the centre, and take temporary shelter in the densely timbered swamps.

Virago gibberifrons. Grey Teal were common about Broome Hill and the south-west generally. One or two pairs usually reared broods of young in my paddocks. Dec. 14/05, a brood of young in down were on the house stock tank; Nov. 10/07, eight fledged young were seen on another tank; Oct. 9/08, watched two parent birds leading their brood of young to house tank; Oct. 23/08, saw four young birds flying strongly with their parents.

Malacorhynchus membranaceus. A Pink-eared Duck was sent to me in January, 1912, for identification by Mr. A. F. H. Muir, who had shot it out of a small party of these Ducks on Lake Muir.

Nyroca australis. White-eyed Ducks were rather commonly seen.

Biziura lobata. Musk Ducks are common on all lakes, swamps, estuaries, and river pools through all south-west districts. Occasionally a solitary bird was seen on a small pool or stock tank. On Dec. 10/12, I saw one on the Broome Hill Roads Board tank, close to the Katanning-Broome Hill road, and the Great Southern Railway. There were generally some in Albany Harbour, and it was extraordinary on a calm day to hear the male birds' loud "plonks," which sounded quite close, but were generally more than a mile distant. In January, 1916, immature birds were numerous in the freshwater lakes adjoining Lake Muir.

Phalacrocorax carbo. Black Cormorants are generally distributed through the south-west wherever there is water. Occasionally a single bird, or a pair, visited my stock tanks near Broome Hill.

Phalacrocorax ater. Little Black Cormorants were common in all south-west areas, and often seen on the Vasse River.

Microcarbo melanoleucus. Little Pied Cormorants, usually known as Shags, were common, especially about estuaries.

Anhinga novæ-hollandiæ. Australian Darters were not observed alive by me in the south-west corner, but in March, 1910, I picked up a dead one on the bank of the Pallinup River, about 25 miles south-east of Broome Hill; this may be accepted as a proof of their occurrence, and I still have its head and bill in my possession here. These birds, according to my observations, do not seem to come in any numbers south of the Swan River.

Sula serrator. Australian Gannets were frequently seen along the south-west coast.

Pelecanus conspicillatus. Australian Pelicans regularly frequented Albany Harbour, especially near "Pelican Point," which is rather more than two miles south from the town; they also occurred in all tidal estuaries along the south coast.

Circus approximans. Swamp Harriers were seldom seen in the immediate vicinity of Broome Hill, there being no swamps, but were common about Lake Muir, and other suitable localities to the south and west. I frequently saw some within a mile or two of Albany township.

Astur fasciatus. Australian Goshawks were common in all localities, and about Broome Hill they seemed to be partial to killing and eating Magpie-Larks (*Grallina*), which birds were then usually plentiful.

Accipiter cirrhocephalus. Collared Sparrowhawks were common about Broome Hill and the south-west generally, and were destructive to small chickens. One of these birds killed a canary as it hung in its cage under my house verandah at Wensleydale. On more than one occasion I saw one of these hawks kill a Purple-crowned Lorikeet (*Glossopsitta porphyrocephala*) as a flock of these very swift little

birds were flying along. Oct. 20/10, having watched a pair of these hawks building a nest about 25 feet up, near the end of a pendent White Gum limb, near to my house, I shot the female bird as it left the nest, but the latter contained no eggs.

Uroaetus audax (Aboriginal, War-lock). Wedge-tailed Eagles were abundant about Broome Hill from May to July when the lambing season was on. They then apparently retired to the heavy forest country south and west to breed. On August 6/08, I was mustering ewes and lambs with another man. At one place we left two weak ewes that had no lambs, as they could not keep up with the rest. We yarded the sheep, and then went round the paddock again for any stragglers. In a corner we found a fine three-quarter grown Grey Kangaroo "bailed up" by two Wedge-tailed Eagles; they were perched in dead trees on each side of the Kangaroo, which was much "blown," as if it had been chased some distance, but it was on its hind legs facing the eagles. I had no rifle or poison bottle with me, and told the man I would return to poison the carcass of the Kangaroo that I expected the eagles would kill. However, when I returned the Kangaroo was lying flat on the ground; the eagles were not there, and I imagined the Kangaroo was dead, and walked close to it, when it jumped up, faced me for a few seconds, and then jumped over the wire fence, and made off, apparently having been only exhausted. I then rode across to the two ewes, and found both dead, and partly eaten by eagles, whose footprints were plain on the soft, bare ground on which the carcasses were lying. I poisoned both carcasses, and next morning found six eagles lying dead in close proximity. Two of them were laid on their backs, and most of the flesh had been stripped from their breasts by other eagles, whose footprints were all around the bodies. I took the four undamaged bodies to the house, and they weighed 51 lbs., and measured from 7 feet to 7 feet 6 inches expanse of wings. On another occasion, I saw two eagles chasing a good-sized Grey Kangaroo. They took turns to swoop at the Kangaroo as it hopped, and to strike it a blow from a wing as they swept over it. Their feet also seemed to be lowered as if trying to get a hold with their talons. If I had not appeared I believe they would have killed the kangaroo between them. March 30/10, I saw two eagles perched on some stunted trees, evidently watching something on the ground. They flew on my approach, and there was a kangaroo, about half-grown, crouching under a Stinkwood "tree," with thick prickly foliage, of whose shelter the kangaroo had undoubtedly taken advantage. Dec. 14/10, a young male Eagle attacked a hen Turkey with a brood of small young, about a mile from my house. The mother bird fought the Eagle, which flew into a tree, and remained there until my neighbour's wife, who had heard the disturbance, got a gun and shot it, afterwards presenting me with the body. Jan., 1916, another neighbour told me that the Eagles had recently killed three of her fine tame Geese. The above neighbours lost tame Turkeys, Geese and Fowls on several occasions through the depredations of Eagles. Mr. F. Muir told me, in 1911, that he generally killed, annually, about fifty Eagles in the vicinity of Lake Muir, and that his uncle on the other side of the lake got about the same number by shooting or poisoning, and this had been going on for many years without much apparent diminution in the number of Eagles. When I purchased my Broome Hill property in 1905, there were two old Eagles' nests on it. One was a large nest high up in an immense Yate tree (*Eucalyptus cornuta*), and a neighbour told me that "Eagle-hawks" had bred in it last in 1900. This tree was blown down in a gale of wind a few years after my arrival, and I took the opportunity of examining the numerous mammalian bones from the nest, and found that they were almost all of the common Grey Possum (*Trichosurus vulpecula*),

which were numerous at that time. No doubt the Eagles had carried the skinned carcasses of these animals to the nest for food after the Possum-trappers had thrown them away.

Haliaetus leucogaster. White-breasted Sea-Eagles were not numerous round the south-west coasts, but I occasionally saw one or two about Albany, and in February, 1905, saw a large nest in a tree close to the beach of Wilson's Inlet (Denmark).

Haliastur sphenurus. Whistling Eagles were occasionally seen near Broome Hill and other south-west localities, but never in any such numbers as they occur in the north-west. They were often seen about Lake Muir, and other sheets of water; Feb. 4/19, I saw one at a pool near Katanning; Jan. 5/22, one seen near Cape Naturaliste.

Lophoictinia isura. Square-tailed Kites were seen only near Broome Hill, and then only as single birds or a pair. Dec. 16/08, saw one at a pool not far from Katanning, and a single bird was seen at the same place on several dates in subsequent years; Feb. 15/11, shot a fine specimen close to my house; Oct. 21/11, one seen in one of my paddocks; March 30/12, a pair seen; Oct. 20/12, a pair constantly seen near my house, evidently breeding near. On this same date a neighbour brought a Kite to me that he had shot at his house when it was attacking his chickens. I made a skin of it, and, as usual in such cases, cut open its gizzard to examine contents, and found in it an unbroken egg of Pallid Cuckoo, which egg was coated over with broken fragments of a Ground-Lark's egg, and made a probably unique specimen, which puzzled me at first (*Vide* "Emu," Vol. XII., p. 178; also Mathews, Vol. V., Pt. II., page 184.)

Falco peregrinus. Peregrine Falcons were not common near Broome Hill, and were not seen in the dense forests of the South-West, as they prefer more open country as around Lake Muir, where wild-fowl are abundant. They are fairly plentiful on the scrubby sandplains east of Broome Hill, where larger timber grows in patches. June 18/10, Mr. J. Hassell gave me a fine male bird, shot near the Pallinup River; Nov. 18/10, a brood of young was seen in the same locality, in a nest in a large Yate tree; they left the nest on Dec. 12.

Falco longipennis. Little Falcons were much more numerous than the above species, and generally distributed around Broome Hill and the South-West. Odd birds were occasionally seen, but around Lake Muir most were observed. April 22/11, I shot one there that had just caught one of a party of White-fronted Chats (*Epthianura albifrons*).

Ieracidea berigora. Brown Hawks were by far the commonest bird of prey, and distributed all thorough the south-west, breeding mostly in September and October. January 1/14, shot a Brown Hawk at Albany that had a snake eighteen inches long in its crop, and the remains of a smaller one; Nov. 1/08, I found three small young in down, and a rotten egg about 25 feet up in the broken fork of a White Gum tree. The only nesting materials were a few greer leaves off the tree laid on the top of decayed wood, and about a dozen small twigs; Nov. 21/08, shot an adult female, changing to dark brown plumage; it had been feeding entirely on Grasshoppers; March 8/10, when camped in the "Pass" in the Stirling Ranges, I shot an unusually large Brown Hawk with hazel eyes, orbits and bill bluish, yellow cere, and yellowish grey legs and feet, and also a smaller bird in much the same plumage, but with bluish cere; Jan. 21/16, shot one at Lake Muir, because I thought it was about to attack some small chickens, but its crop was full of caterpillars and grubs.

Cerchneis cenchroides. Nankeen Kestrels occurred rather commonly around Broome Hill and through the South-West. Nov. 2/08, a pair had a nest in a hole in a large dead White Gum.

Pandion haliaetus. Ospreys were seen on several occasions near Albany in 1905, and later dates. Also at Wilson's Inlet in 1905, at mouth of Margaret River in 1902, and in March, 1916. In April, 1919, I saw one near Augusta, and in February, 1922, saw two pairs at different places between Augusta and Geographe Bay.

Ninox boobook. Boobook Owls were common about Broome Hill and the South-West generally. They are rather erratic in their calling, as sometimes they were heard almost every night for several weeks, and then there would be none heard for a corresponding length of time. June 21/10, I shot one that was being mobbed by Red Wattle-birds. In its gizzard were two legs and feet, also some wing bones, with feathers attached, of Yellow-banded Parrots, which I concluded had been picked up near a homestead where someone had been making a stew from these Parrots.

Ninox connivens. Only one Winking Owl was seen during my long residence in Western Australia, and that was at Lake Muir. April 23/11, about 6 p.m., at dusk, I was passing through some fairly large Jarrah and Red Gum timber close to the station outbuildings, when a rather large bird came out from a tree, and alighted in another tree about 150 yards further on. I was fortunate in being able to secure the bird, and my excitement was great on finding that it was one quite new to me. It was a male bird, weighed 2 lbs., and measured 17 inches in length and 42 inches expanse of wings. Upon skinning it, I found that it had been feeding on large Brown Beetles and small, furry animals, that seemed to be mice, so apparently these birds destroy some harmful things. Some time afterwards I showed the skin to the late Mr. George Warburton, who owned Yeriminnup Station, on the Gordon River, and he said that he had, many years previously, shot a similar Owl that had been destroying his poultry.

Tyto alba. Barn Owls were never seen alive by me, but I have seen stuffed birds at Augusta, Busselton, and other South-West localities, that I was assured had been obtained there. The late Mr. Norrish, whose land joined mine at Broome Hill, told me he had occasionally seen one or two, but they were rare. (He was one of the earliest settlers in that district.) I also saw a specimen at Albany that had been shot there.

Tyto novae-hollandiae. Masked Owls were not observed near Broome Hill, but they seem plentiful in some of the dense forests of the more south-westerly areas. In March, 1916, when travelling late at night (10 p.m.) on the motor mail coach from Busselton to Augusta, bush fires were raging for several miles in the Karri forests north of Augusta, often being up to the edge of the road on both sides of us. It was a fine sight, but there was the risk of a burning branch or tree blocking the road at any moment, and, as the driver was two hours late, he drove quickly. Many large Owls, showing white underneath, were seen, flying over the road ahead of the car, and sometimes over it, only a few feet above our heads. They were looking for small animals, lizards, etc., that had been driven on to the road by the fire, and several times I saw an Owl seize something from the ground a short distance ahead of us, and fly off with it; they did not seem to be affected by the glare of the fire or the headlights of the car. The driver told me that he frequently saw Owls when travelling by night. These Owls could only be Masked Owls, and on the same visit to that district I saw a pair of wings of this species hung on the walls of a house in Busselton.

Glossopsitta porphyrocephala. Purple-crowned Lorikeets were common about Broome Hill and through the South-West. Their presence depended upon which variety of Gum-tree (*Eucalyptus*) had the most abundant crop of blossoms. As White Gums, often

called Wandoo (*E Redunca*), were the most numerous trees about Broome Hill, these Lorikeets abounded when these trees had a good year for blossoms, which happened about every third year, and the active little birds simply swarmed over the pretty honey-laden flowers, chattering loudly all the time. They flew at great speed, and many were killed by striking against wire fences. It was a common event to find several lying dead outside my netted fowl run. When it was a good year for Red Gum or Jarrah to blossom, these birds would be most plentiful in the forests to the west and south, where these trees prevail. Thus I have a note in my journal: March, 1919, very scarce about Broome Hill as no blossoms on White Gums, but plentiful about Augusta, and getting honey from Red Gums. The breeding season is about October.

Calyptrorhynchus baudini. White-tailed Black Cockatoo (Aboriginal, Oolack).—This is the commonest Cockatoo through the South-West, and their rather melancholy notes, from which the aboriginal name is derived, can be heard anywhere. They were not so numerous about Broome Hill, but flocks were often seen there, and also thirty miles further east, where they regularly nest. Aug. 7/08, a pair preparing nesting cavity in large tree, 30 miles east of Broome Hill; Sept. 22/08, young birds heard in the above "nest"; Oct. 19/08, a fledged young bird seen at same place, and another nesting cavity seen in large tree, about twelve feet from ground; Sept. 1/10, two fresh eggs obtained; Oct. 3/10, about 25 miles east of Broome Hill, the driver of the mail coach pointed out a large tree in which he said Cockatoos had nested for several successive years. He told me that when the nest was occupied, one of the adult birds almost invariably appeared in the mouth of the nesting hole as he passed, and one did as we passed. This nest was in a large Morrell tree (*Eucalyptus longicornis*), and about twenty-five feet above the ground; Jan. 26/05, a bird shot at Albany had several caterpillars (not grubs) in its mouth and crop; Feb. 10/14, fully fledged young were seen being fed by parent birds near Albany.

Calyptrorhynchus banksi. Red-tailed Black Cockatoos (Aboriginal, Koorark) were fairly common in the Red Gum and Jarrah forests of the South-West, soon after my arrival in Western Australia in 1887, but they are sadly diminished in numbers now, partly owing to land being cleared of timber, but mostly, I think, from their being shot to obtain the beautiful tail feathers. None was observed near Broome Hill, but there used to be many of them round Lake Muir, and I saw several small parties of them there in March, 1919, and also on the Blackwood, Collie, and Warren Rivers, about the same time. On my last visit to Western Australia, 1921-2, only two small parties were seen. I have no breeding data.

Cacatua roseicapilla. Galahs (Rose-breasted Cockatoo) were never seen in the South-West area, and the only record of their occurring there, as far as I know, was given me by Mr. J. B. Higham, whose information can be accepted as correct. He told me that two pairs nested in the Williams River district, about seventy miles north-west from Broome Hill, in August, 1918, and reared three and five young birds respectively. All the birds went away (apparently) early in 1919, and two months afterwards four of them returned (or were seen). The "nests" were in White Gum trees.

Leptolophus hollandicus. Cockatiel (Cockatoo-Parrots) were seen in some numbers in 1911, a few miles to the east of Broome Hill, and I had some brought in to me that had been shot there. 1911 was a very dry season, which may account for the appearance of these birds so far south of their usual habitat. I never saw

or heard of any record of this Parrot anywhere else in the South-West area.

Platycercus icterotis. Western (Yellow-cheeked) Rosellas were common at Broome Hill, and through the South-West generally. They nest about September, the usual clutch of eggs being three. Sept. 6/06, I found two nests, each with three eggs; in mid-Dec., 1906, many fledged young were seen about my house; Dec. 18/07, young birds were still in nesting cavity; Nov. 20/08, many fledged young seen. These Parrots are very quiet and tame in disposition, and did not often attack fruit in my orchard, but it was a common sight to see some of them picking grains of corn out of the mangers in my stable, under the very noses of the feeding horses.

(To be continued)

Camera Craft

The Variegated Wren. —During last season I found four nests of the Variegated or Lambert's Wren (*Malurus lamberti*), but did not succeed in getting any pictures of the occupants of the first three. All the nests were built in grass from four to eight inches from the ground in open, scrubby situations.

The first nest was noted on August 6th, being then about half built. I observed the female pulling the bark off a tea-tree and tracked her to the nest. After building the nest, the birds were a long time laying the eggs; it was not until August 23rd that three eggs were noted. A few days later, disaster overcame the nest, and I found it partly broken down and the eggs missing. At the time I attributed this to boys.

About September 23rd I found a pair commencing nest-building, and in less than a week the nest contained three eggs. The same fate overcame this nest as the first, for, on visiting it one day I found the hood of the nest forced back and the eggs missing. However, at the bottom of the nest were pieces of egg shell, so apparently it had been robbed by some animal. Probably the same cause accounted for the disappearance of the eggs in the first nest.

On the 24th September, while taking the photo of a Pardalote (Diamond-bird), I noticed a pair of Lambert's Wrens building within five yards of me. A Bronze Cuckoo also found the nest and visited it twice while I was there. I focussed on the nest in the hope of its return, but I saw no more of it. On October 6th, the nest contained four eggs of the wren and one of the Narrow-billed Bronze Cuckoo (*Chalcites basalis*). On October 17th, the cuckoo was hatched out, and in due course the eggs of the wren were ejected. On October 21st, I went to photograph the birds, but was deeply disappointed to find the cuckoo dead beneath the nest. I have not the slightest idea what happened to it, unless it climbed to the entrance and fell out, for the wrens certainly could not have thrown it out.



1875

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Dusky Wood-Swallow on Nest

Photo by L. G. Chandler, R.A.O.U.



White and black boys at nest of Brolga, or Native Companion.

Photo. by Mrs. Adam Black, R.A.O.U.

I had better luck with nest number four, and secured several pictures. The nest was prettily situated at the foot of a small dwarf apple tree (*Angophora*), amongst a tangle of grass and tiny flannel flowers (*Actinotus minor*). The birds soon became very tame, and hardly took any notice of me. For most of the photos the shutter was released by hand at a distance of about three feet from the nest. Both birds often gave voice to their song, a rather unmusical rattling call quite unlike that of the common Blue Wren. They had the characteristic mouse-like creep of the common bird when alarmed for the safety of the nest. It was indeed a privilege to be able to observe so beautiful a bird at such close quarters. The female can readily be distinguished from the common Blue Wren by the much longer and darker coloured tail and the more distinct reddish brown colour round the eye. Both birds were kept busy feeding the three hungry young birds.—NORMAN CHAFFER, R.A.O.U., Willoughby, N.S.W.

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Wood-Swallow Notes. —The various species of Wood-swallows that breed in Victoria are, as a rule, rather wary, when confronted with a camera. The Dusky Wood-swallow (*Artamus cyanopterus*) is probably the easiest to approach, although I recall specimens of this species that refused to face a camera. The bird in the illustration was quite tame, and left the nest only for short periods, when her mate appeared with food. On a few occasions he fed her on the nest, but would not pose. The utter disregard of the camera that was exhibited by the sitting bird was not shared by him. In the majority of cases among wild birds, it is noticed that the female bird is more venturesome, and shows a braver attitude in visiting the nest or feeding the young in face of apparent danger.—L. G. CHANDLER, R.A.O.U., Red Cliffs, Vic.

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North Queensland Notes.—The accompanying snap photo. is typical of the way Native Companions (*Brolgas*) nest in North Queensland, in a depression that fills and forms a swamp in the wet season; it has been used for many years by a pair. The water was not more than a foot deep surrounding the tree, not shown to the right, from which the branches had fallen, and where the water was shallower. The boys are also typical of North Queensland, a white and a black. This black boy is the only aboriginal on our station, a little orphan that I have taken care of and reared from almost infancy.

These birds evidently consider themselves competent to take care of their nest, as they do not trouble to conceal it. We went quite close to the nest (about a chain) at the water's edge, and the parent birds went only a few yards away, even while the children were there, and the photographer waded in and took the photo.

We have an unusual number of birds about our home and garden, owing to the dry time we are still enduring, but the only new birds are a family of about 30 Apostle-birds (Gray Jumper) that come to sleep in a Tamarind and Burdekin Plum trees that grow quite close to our house buildings. Previous to this year we knew of them only, some 45 miles from here. White-winged Chough are always about, and in bad insect dry years come regularly to hunt through the mulching under our citrus trees for beetles, etc.

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In the article in last *Emu* (*ante*, p. 3), on the subject of the **White Goshawk** (*Astur novæ-hollandiæ*), mention was made of the fact that up to the time no plate of the bird had been taken. Mr. S. W. Jackson has since, by exercising great patience, ob-



tained a very good snapshot, which accompanies this note. A hole was cut in the wire netting, and the camera focussed on the feeding spot. For two days the bird refused to leave its high perch, but at length hunger compelled it to give a good pose. At times, in certain lights, I fancy I can see a tinge of yellow appearing in the iris.—HENRY L. WHITE, Belltrees, N.S.W., 5th Sept., 1923.

Many people in the town of Charters Towers are complaining of the damage to gardens by flocks of birds that go in pairs and dig up seedlings, etc. I could not approach them closely, but think they are Pied Bell-Magpies. There are magnificent weeping figs all over the town, and perhaps the fruits on them have induced the birds to stay, and, of course, they see and help themselves to other food.—MRS. ADAM BLACK, Pajingo, *via* Charters Towns, Q.

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The estate of the late Mr. J. E. Chubb, R.A.O.U., contains some useful photographic material—dishes, large dark-room lantern, chemicals, etc., besides a camera in good order. Any young beginner, or other photographer, who would like to acquire the same, at much reduced price, may apply to the Editors, *The Emu*.

Stray Feathers

Strange Behaviour of a Spinebill.—Once while I was walking down an old bush track through thick Banksia country, a Spinebill Honeyeater flew on to the track and hopped about as though hurt. I knew it was not nesting time, so I watched him from a bush about 12 feet away. I had been seated about a minute when the bird flew down to a bare patch under a Banksia bush. Here I was surprised to see on the ground, a dead Spinebill, evidently the mate of the bird I was watching. As soon as he reached the dead bird he uttered that soft “chee-chee-chee,” as these birds do when nesting. This he kept up for nearly a minute. As this had no effect on his dead mate, he lay down on his side and grasping the dead bird by the back with his claws, endeavoured to move it about. I was surprised to see that he did move the body six or seven inches along the ground—quite an effort for a small bird like a Spinebill.

The poor little bird was quite at a loss, and, after standing by, twisting his head on one side and looking at his dead mate for a time, he walked over him twice and flew off. I waited to see if anything else would happen. The bird came back, but, after approaching the dead mate from several different directions (always hopping along the ground, and not flying straight down), he at last gave it up. I was sorry I had not my camera, as I could easily have photographed the birds. There had been a cold wind for about a week, and in the last three days I had found a Barn-Owl, a Spinebill, a Lewin's or Yellow-eared Honeyeater, and a Peaceful Dove (*Geopelia placida*) all seemingly killed by the cold, as they bore no marks of injury, but all were very thin.—ARTHUR F. D'OMBRAIN, R.A.O.U., “Hylacola,” Somersby, Gosford, 6th June, 1923.

Giant Petrels in Sydney Harbour.—On the 17th June I saw on North Harbour (Sydney) two Giant Petrels (*Macronectes giganteus*); which were perched on the rocks at Dobroyde Point. They allowed me to come within a boat's length before they made off. I was close enough to see all distinguishing marks on the beak, legs and feet.—E. HUNGERFORD. (Communicated by A. S. Le Souef, C.M.Z.S., Taronga Park, Sydney).

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New Snake Discovered on a Bird Expedition.—The Giant Venomous Snake—*Oxyuranus maclelleni*, Kinghorn. The first note relating to the discovery of this new snake was published by Mr. H. L. White, Belltrees Scone, N.S.W., in *The Emu*, 1922 (vol. xxii., p. 103), as an item from the diary of Mr. W. Maclellan, R.A.O.U., who was its discoverer and collector in the Cape Yorke Peninsula. A complete skin, containing a skull, and a second beautifully cleaned and preserved skull (both from specimens about 9 feet in length) were presented to the Australian Museum. An examination showed that the fangs were so large they would easily penetrate through one's finger, if bitten; I found that there was only one small tooth following the fang (excepting those in reserve), and this, together with several cranial characters, gave me quite sufficient evidence on which to decide that the Snake did not belong to any known Australian genus, and wide comparisons with foreign snakes led me to conclude that it was a new genus and species, and undoubtedly the most dangerous snake in Australia. Full comparative characters, together with description, text figures and plate will be found, in the Records, Aust. Museum, 1922, Vol. xiv., pt. 1, p. 42. Venom was collected, but unfortunately, the tubes were corked up before the poison had dried, with the result that it fermented, and is of little use. There is no work being done on venom in Australia at present, and so (after proper drying of what remains) it will be kept aside or perhaps sent to Paris, if required. The fangs of this snake, which are enormous, are about equal in size to those of some of the Vipers, such as the Rattle Snake. When the specimen was opened it was found to contain the remains of a Dasyure.—J. R. KINGHORN, R.A.O.U., Zoologist, Aust. Museum, 24/7/23.

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Black-shouldered Kites in Eastern Queensland.—On several occasions during the past winter I have had the pleasure of seeing Black-shouldered Kites (*Elanus axillaris*) in the coastal districts of Queensland. There can be little doubt that the drought prevailing at the time in the inland districts had driven them coastwards. On April 15th, 1923, I observed a pair hovering over a cotton-field at Gracemere, near Rockhampton. On May 12th, two were seen hovering over fields near the bank of the Brisbane River, near Indooroopilly, and, on May 29th, one was seen not far from the same locality at Yeerongpilly.

In each case the birds were hovering, poised in the air, with rapidly beating wings and widespread tails, just like Kestrels. I was not previously aware that the birds of this genus had this habit, associated in my mind with members of the genus *Cerchneis*, as observed in various parts of the world. Careful search through the literature accessible to me showed that the habit had been mentioned by a few writers, but the peculiarity does not seem to have been emphasised. Apart from the Humming-birds, very few birds are capable of hovering, or at least if they are capable of it, they rarely indulge in the habit. Apart from the hawks mentioned, the Brown Hawk (*Ieracidea*) occasionally hovers for a short time. The Little Terns (*Sterna*) constantly hover over shallow water, whilst watching for small fish, and some of the larger Terns make a more clumsy attempt to perform the same manoeuvre. Our Restless Flycatcher (*Seisura*) must not be forgotten, though when hovering it does not remain long stationary like a Kestrel. In South Africa, I watched a bird hovering over a pool, which I at first took to be a small Tern, but it proved to be a Pied Kingfisher (*Ceryle rudis*). I never saw any of the Australian Kingfishers do this. Can any readers of *The Emu* add to my list of hoverers?—W. B. ALEXANDER, M.A., C.F.A.O.U., Sherwood, nr. Brisbane.

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The type locality of the White-browed Tree-Creeper. — There appears to be some misunderstanding as to the correct identification and locality of North's Allotype (type of the female) of the White-browed Tree-creeper (*Climacteris superciliosa*). The story is as follows:—In *The Ibis*, ser. 7, Vol. 1, No. 3, 1895, p. 341, North described the species as new, giving the habitat as Illara Creek, Central Australia. The next year, in the Report on the Horn Expedition, p. 96, he redescribed the species, giving the habitat as "Moolah, interior of N.S.W., Illara Creek and Bagot's Creek, Central Australia, and Queensland." The Bagot's Creek specimen bears a collector's label marking it as a female, but there is absolutely no doubt as to its being a male bird. North, in his Report on the Horn Expedition, 11, p. 97, says: "Upon examining the reference collection in the Australian Museum, I find there are a male and female of this species obtained in July, 1883, by the late Mr. Kenric Harold Bennett, on Moolah Station, in the interior of New South Wales. The specimens procured by Mr. Keartland, at Illara Creek and Bagot's Creek, are alike in plumage, and are marked respectively male and female, but the examples obtained by Mr. Bennett, at Moolah, and shot together while nesting, vary as described above," etc. Later, in the year 1906, in his "Nest and Eggs," Vol. II., p. 51, North says: "During the journey of the Horn Scientific Expedition to Central Australia, in 1894, Mr. G. A. Keartland obtained two males, one at Illara Creek, and the other

at Bagot's Creek." This statement, together with the two facts (1) that the male and female differ in colour, and (2) that both the Central Australian birds were identical in colour, makes it plain that North described the female from a bird which came from a different locality from that of the male, and taken at a different time. All the skins are in the Australian Museum, and as they have been examined by us we can definitely state that the Holotype was taken at Illara Creek, and the Allotype from Moolah, N.S.W., both birds being registered and labelled as such. It is self-evident that in the original description the locality of the Allotype was inadvertently omitted, and just why North did not describe from *both* the Moolah birds is, and will remain, a mystery.—J. R. KINGHORN, Zoologist, and H. O. FLETCHER, Assistant Zoologist, Australian Museum.

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Some Masked Plovers on the Brisbane River. — On May 12, 1923, I visited a tidal sand bank in the Brisbane River, near Indooroopilly, which at high-tide is an island, though at low-tide it is connected with the river bank at one point. There were numerous birds feeding on this "island," as the tide was low, and amongst others a flock of Spurwing Plovers (*Lobibyx novæhollandiæ*). Close to them, but not actually mingling with them when first noticed, was a Masked Plover (*L. miles*). The birds were fairly tame, and with my glasses it was easy to make out the large yellow lobes on the sides of the face, with the lower angles hanging below the throat, and the complete absence of the black patches on the shoulders, which distinguish the northern bird from its better-known congener. Presently one of the Spurwings came and joined its relative, and fed alongside it, so that their differences could be contrasted even more easily. No difference in size was perceptible, but the Masked Plover appeared to be a rather lighter brown on the back.

My only previous acquaintance with the Masked Plover was at Mackay, where flocks of them were common in November, 1922. During my residence in Central Queensland, I examined every party of Spurwings I saw, and they are common about Rockhampton, in the hope of seeing a Masked Plover, but I never saw one. As far as I can ascertain, no one else has previously met with one south of Mackay. In his "Birds of Australia," Vol. III., page 45, Mr. Mathews writes, when dealing with the Spur-winged Plover:—"I have specimens of this and the next species, shot on the same day in Queensland." Since Queensland is a large State, and both species are well-known to be resident in it, there is nothing remarkable in this statement, as it stands. I presume Mr. Mathews meant to imply that they had been shot by the same person, or in the same locality. If so, it would be interesting if he would state in what part of Queensland the two species have previously been met with together.—W. B. ALEXANDER, M.A., C.F.A.O.U., Sherwood, nr. Brisbane.

Semi-Hibernation of Swallows. — A correspondent, M.F., in writing to the Sydney "Bulletin," of 12/7/23, says "that this is the third consecutive year in which Swallows have been found in N.W. Tasmania, in the months of June and July, packed away in cavities of dry trees felled for firewood. This year 16 were found in one tree. The first discovery of the kind was made between Wynyard and Mt. Bischoff by two prospectors in 1921, and last year two men cutting wood in the district felled a tree with 37 Swallows packed away in it. The jar of the falling tree killed some, the others fluttered about the ground for a while, and eventually took wing."

I do not know who M.F. is, and see no reason to doubt the statement, as a small number of Welcome Swallows (*Hirundo neo-rena*) have stayed the winter in Launceston for a number of years, using deep crevices among the rocks of an old quarry in which to shelter, and coming forth on sunny days in June and July to pick up any available insects. On 26th July this season I saw a pair on the outskirts of Devenport, skimming about at a fair height, and evidently enjoying the warmth and sunshine of that fine afternoon. These had probably not crossed the Strait, but had been sheltering away in the bush until the unusual warmth called them out. It was not until 13th of present month (August) that any appeared in the streets of the town, and they were about a fortnight earlier than usual.—H. STUART DOVE, F.Z.S., R.A.O.U., W. Devonport, Tas., 15/8/23.

The Origin of Some Bird Names. —In that highly original and suggestive paper on the Granite Belt, by Roberts and Jarvis, in the April *Emu*, there occur, near the close, some remarks on the names *Acanthiza* and *Reguloides*. The latter means "Regulus-like," and the meaning of the noun is given as "a staff," but *Regulus*, in Latin, means "a little king," diminutive of *Rex-regis* —that old friend of our boyhood in the Latin Grammar. The name was given to the genus which includes both the Gold-Crest and Fire-Crest in Britain, simply on account of the crest adornment, which crowned them "little kings."

Regarding *Acanthiza*, the most probable derivation seems to be from Greek *Acantha*—a thorn, coinciding with the vernacular "thornbill." In this connection may be quoted the wee "Rifleman," of New Zealand, which is known also as "Spinebill" in those islands, the general name *Acanthidositta* meaning "spine (bill) nuthatch." In Sir Walter Buller's "Manual of the Birds of N.Z.," 1882, the name of the genus is given as *Acanthisitta*, which brings it as close as need be to the *Acantha* derivation. This name was bestowed in 1842, by Lafresnaye, and why it was altered is difficult to say. Anyone who studies the admirable figure of the head of this smallest of N.Z. birds in Buller's Manual, will have no doubt as to the spine-like appearance of the bill, from which, as I believe, the naturalist mentioned above derived the name.

An instance from another class is the "Picked Dog-fish" of British shores, known as *Acanthias*, from the sharp spine projecting in front of each dorsal fin, with which the fish can inflict painful wounds.—H. STUART DOVE, F.Z.S., W. Devonport, Tas.

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Courtship of the Gould Harrier. — Each year, at the season of early spring, my attention has been attracted by a short, oft-repeated scream, apparently coming from the sky. On looking upward, there, in the high empyrean, glides the male Harrier, and as he glides, ever and anon, turns a complete somersault, at the same time uttering the short, penetrating note to which reference has been made. Some distance away, in great circles, glides his mate; at times their paths approach, only to separate again. These manoeuvres are repeated several times a day, especially in fine, windy weather, as at present; it is quite fascinating to watch the easy gliding flight, often at an immense height, of these powerful hawks, and to note the frequent graceful somersaulting of the male. At whatever height he may be, his scream is of a sufficiently penetrating nature to be audible to the ear of a terrestrial observer.

Small wonder that Lord Lucas found delight, during furloughs in England, in watching the graceful flight of Harriers over his Norfolk estate, and that, himself an intrepid airman, he should leave, at his premature death, a sum of money for the protection of the Hawks and their breeding-grounds on that estate. Some of the landed proprietors of Australia and Tasmania might well follow this example, and protect their valuable allies. — H. STUART DOVE, F.Z.S., W. Devonport, Tas., 8/9/23.

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The Cuckoo Problem. — That well-known English naturalist, E. Kay Robinson, writing in the "Countryside" on the question as to whether the Cuckoo ever inserts her egg with the bill, says: "So many instances of the eggs being found in nests with entrances much too small for the bird to have entered, have been given, that one cannot suppose that all the writers were mistaken; but what puzzles me is that Nature, which in other respects appears especially careful of the Cuckoo's interests, should allow the bird to make what appears to me the fatal mistake of putting its egg in a nest with so small an entrance that the young bird could never get out, but would be condemned to a lingering death."

Our colonial Cuckoos, at any rate, do not wait for death to overtake them, but cut the gordian knot in Alexander-like fashion. An instance came under my notice of a young Fan-tailed Cuckoo (*Cacomantis flabelliformis*) in a nest of the Brown Thornbill (*Acanthiza pusilla*). He pitched out the eggs of the host through the diminutive circular entrance at the side near the top, an entrance which just allowed the passage of an average forefinger; when he grew so big that the nest became too stuffy,

he worked his head through the aperture, then the neck and shoulders, and sat there in state, while consuming all the insects brought by the Thornbills. There was no difficulty in working the body out when the time came, but the nest was left in a very disintegrated condition. — H. STUART DOVE, F.Z.S., R.A.O.U.

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The Northern Range-Limit of the Royal Albatross.—Perhaps it may be of interest to report what appears to be an unusual northern range of *Diomedea regia*.

On May 28th, 1923, from 15 to 20 of these regal birds were following the s.s. "Tofua" on her customary Auckland-Suva route. The majority of the flock were old birds, the remainder younger and of (probably) varying ages. The wind was southerly; it was distinctly cool, and the sea was quiet.

At noon the chart-room temperature was 73° F., corresponding to a (calculated) outside or ocean temperature of 70°; location, 22° 5' 0" S. Lat., 177° 27' 0" East Long. Some time during the following night all the albatrosses disappeared.

The moon was nearly full, and the night was very clear, but no bird could be seen after nightfall. The next morning no *Diomedea* was in sight, and during the day none was visible on the horizon. However, on the following morning (May 30th), a young individual appeared, and flew about the ship all day until 5.30 p.m., when it, too, disappeared. No others were subsequently seen.

The temperature on board at this date was 72° F. at noon, and we were then at 20° 3' 0" S. Lat., 177° 54' 0" East Long., about 120 miles south of Viti Levu. Officers of the "Tofua" who have been following the course Auckland-Suva for five years assure me that they do not remember having observed any albatross so far north before.

The foregoing observation tallies with Le Souef's report in a recent number of *The Emu* that *Diomedea exulans* uniformly deserts a ship and flies south when the temperature at 4 p.m. rises to 70° F. In other words, the temperature of the air more than any other factor determines the range of the South Sea albatross.—CASEY A. WOOD, F.Z.S., R.A.O.U.

Forgotten Feathers

A LETTER FROM DR. LATHAM:

W. B. Alexander, M.A., C.F.A.O.U., writes from Sherwood, Q.

Sir,—I have recently acquired an original letter by Latham, which you may think of sufficient interest to publish, especially as it happens to be just a hundred years old. I enclose a transcript of it. The latter was written when Latham was 83.

The drawings of legs referred to in it are excellent for the purpose of indicating the difference between "booted" and "scutellated" tarsi. Being mainly in pencil they would be difficult to reproduce. We have much about Gould, but the "grandfather of Australian ornithology," as Mathews called him, has been rather neglected, I think. He was born in 1740, and died in 1837. The letter was addressed to a Mr. T. W. Chevalier.

Winchester, May 14, 1823.

Dear Sir,—I am greatly obliged by your communication concerning the *Phœnicophaus leucocephalus*, and equally so for the account and drawing of the *Cariama*—concerning the latter of which I wish to trouble you to know what kind of sections the shins were composed of, whether divided by scales, or tessellated; also whether the nostrils are at the base or in the middle of the bill, and these being known, I shall be able to identify the bird sufficiently.

In respect to the *Phœnicophaus*, I do not wonder at your not finding it in my old work, *The Synopsis*, as at that time authors ranked it with the Cuckows—See Syn., Vol. 2nd, p. 544—called there the *Red-headed Cuckow*—and figured in Indian Zoology of Mr. Pennant, pl. 6—but I have fully described this, and four others, in my last *General History of Birds*, Vol. 3rd, p. 252, *et seq.*, under the name of Malkoha, and figured one in Plate 55. This is also described in *Lin. Trans.*, XXII., 287, as *Cucul Sumatranus*, and another in the same, and *Cucul. melanonathus*, my *Sintoh*, No. 4—likewise another, p. 288.—*Cuc. chlorophaeus*, which is new to me, and I did not know of it till my sheets were printed off. Should none of your friends be subscribers to my work, if you will call at Mr. Woods, Bookseller, 428 Strand, he will most readily show you a copy. I have now published 6 volumes, and the other four, to complete the work, will certainly appear at 3 months distance each. It is certain that many valuable and scarce birds may have escaped my researches, for there are new things coming in daily, but you will, I trust, give me credit for not being idle in collecting materials from every source in my power. To make a complete ornithology is impossible—we can only arrive at a certain point, and our successors must do the rest.

I have sketched two legs on the other side that you may know my meaning in respect to the segments of the shins, and you will have the goodness, some future day, to give me a line or two to say with which the legs of the *Cariama* most correspond, or if, as in some birds, they are perfectly smooth, as also the situation of the nostrils.

I beg my best remembrances to your father, and remain,

Dear Sir,

Your obliged humble servant,

JOHN LATHAM.

Review.

[“An Australian Bird Book.”—A complete Guide to the identification of Australian Birds, by J. A. Leach, D.Sc., President of the Royal Australasian Ornithologists’ Union, Colonial Member British Ornithologists’ Union, Corresponding Fellow American Ornithologists’ Union, Sometime President Field Naturalists’ Club of Victoria, etc., Hon. Editor “The Emu,” Organising Inspector of Nature-Study, Education Department, Victoria, Author of “Australian Nature-Studies.” With introduction by Frank Tate, C.M.G., I.S.O., M.A., Director of Education, Victoria. Published by arrangement with the Education Department, Victoria. Whitcombe and Tombs Limited, Christchurch, Wellington, Dunedin, N.Z., and London, Melbourne, 1923]

“How this ornithological compendium, or “Australian Birds in a Nutshell,” was written and published for 3/6 is marvellous. Its author and his enterprising publishers have indeed given to the world a unique book. Australians especially will be greatly indebted to Mr. Leach for his untiring labours, and to the long-sightedness of his department in sanctioning the publication of such a useful “bird book,” the just reward of which must surely be many editions.” That prophesy twelve years ago* has been literally fulfilled in the present edition—the fifth; revised and enlarged.

The old edition was somewhat limited to “birds found in Victoria,” although many Victorian species are found throughout Australia. In the supplement of the present work, there are added over 300 species, so as to include a brief and concise description of every Australian species, together with a total of 20 coloured blocks, depicting 177 species, besides half-tone and line reproductions of between 400 and 500 species (which for drawings, etc., the author makes full acknowledgment to others).

Being convener of the new Check-List Committee, Dr. Leach is abreast of the times in both vernacular and scientific names, and has adopted the names which will probably appear on the new list—names for all time, it is hoped.

The following illustrates the practical utility of the book for identification purposes. An ocean waif was blown inland near Geelong, and was found by some State school scholars, who took the captive to the headmaster. The boys produced “Leach’s book,” and proved the little bird to be the Wilson Storm-Petrel, bred, no doubt, among the ice-fields of Antarctica. The specimen in due course was presented to the National Museum, where its name was confirmed, and the specimen, in perfect state of plumage, with its interesting history, is now exhibited in the bird-gallery of that institution.

The best thanks of the nation are due to the talented and painstaking author for a handy work that will stimulate the rising

*See previous Review.—*The Emu*, Vol. X., p. 350.

generation in the study of ornithology, and thus carry on the science when the present-day workers have laid down their pens. The book is beautifully printed, and more than well worth its enhanced value—7/6. (Communicated).

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[Smithsonian Institute, United States National Museum, Bulletin 121. "Life Histories of North American Petrels and Pelicans and Their Allies," by Arthur Cleveland Bent, of Taunton, Massachusetts.]

This important "Bulletin," like its predecessors by the same author, contains a mass of laborious work of a painstaking and accurate kind. Mr. Bent has dealt lucidly and simply with his subjects. The great order Tubinares, or Tube-nosed Swimmers, is of world-wide interest, and many of its species appeal to Australians in particular. Mr. Bent's nomenclature differs in a few instances from that of the amended Australian Chick-list. The following are the Australian species mentioned, with the name adopted by Mr. Bent in parenthesis where different: — *Diomedea chrysostoma* (*Thalassogeron c. culminatus*), *Diomedea chlororhynchus* (*Thalassogeron chlororhynchus*), *Phæbetria palpebrata*, *Macronectes giganteus*, *Priocella antarctica*, *Daption capensis*, *Puffinus carneipes* (*Ardenna carneipes*), *Puffinus assimilis*, *P. griseus*, *P. tenuirostris*, *P. pacifica* (*Thyelodroma pacifica*), *Priofinus cinereus*, *Pterodroma inexpectata*, *Oceanites oceanicus*, *Fregetta leucogaster*, and *Pelagodroma marina*.

Obituaries

THE LATE MR. JOSIAH EDWARDS CHUBB.

The Union has lost another member by the death of Mr. J. E. Chubb, which occurred on June 3rd last, at Auburn, Victoria.

The late Mr. Chubb was born on November 24th, 1862, at Yeovil, Somerset, England, and at an early age exhibited a strong instinct for Natural History. He became apprenticed to a furrier and taxidermist. When out of his time he sailed, in 1884, for New Zealand, with the intention of visiting relations there. Passing through Melbourne, naturally, he made his way to the National Museum (then at the University), where he chanced to meet the Director (the late Sir Frederick McCoy). Seeing Chubb's credentials, the Professor invited him to undertake an urgent temporary job—to prepare an exhibit of birds, mammals and fish for the Colonial and Indian Exhibition (1886). The exhibit was awarded a first-class medal and certificate.

Mr. Chubb was then requested to report on the condition of the mammals, birds, etc., in the Museum, which report led to his appointment as taxidermist from July 1st, 1885. Therefore he had 38 years' service to his credit. But nothing testifies more eloquently to his worth than his handiwork displayed in the

mounting and posing of various specimens that are among the exhibits in the Museum.

The late Mr. Chubb was curator of bird-skins in the R.A.O.U. Collection, and by virtue of that office was a member of Council till he resigned, owing to ill health. He was a conscientious and painstaking worker, with a critical turn of mind, which might be deemed by those who did not understand him as a complaining mood. It was this critical spirit that led Mr. Chubb, during the annual meeting of the R.A.O.U., Sydney, 1921, to notice in the valuable Macleay Collection that certain specimens needed immediate overhauling if they were to be preserved for posterity. This led to the forwarding of a joint report with Mr. A. J. Campbell, through the Council of the R.A.O.U., to the Authorities concerned, and remedial measures were soon taken.

Mr. Chubb visited King Island, Bass Strait, in April last, to recuperate his health. While there he believed he identified the following birds, which have hitherto not been recorded for that locality, namely:—Black-breasted Buzzard (*Gypoictinia melanogaster*), Rosella (*Platycercus eximius*), Warbling Grass Parrot (*Melopsittacus undulatus*), Scarlet-breasted Robin (*Petroica multicolor*), White-throated Tree-creeper (*Climacteris leucophaea*), Oriole (*Oriolus sagittatus*), White-backed Magpie (*Gymnorhina hypoleuca*), and Black and White Fantail (*Rhipidura leucophrys*).

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"BEACHCOMBER" BANFIELD, OF DUNK ISLAND.

An idyll of tropic life closed, and the birds of Australia lost a stalwart champion, when Mr. E. J. Banfield, R.A.O.U., died at his home on Dunk Island, North Queensland, on 2nd June last.

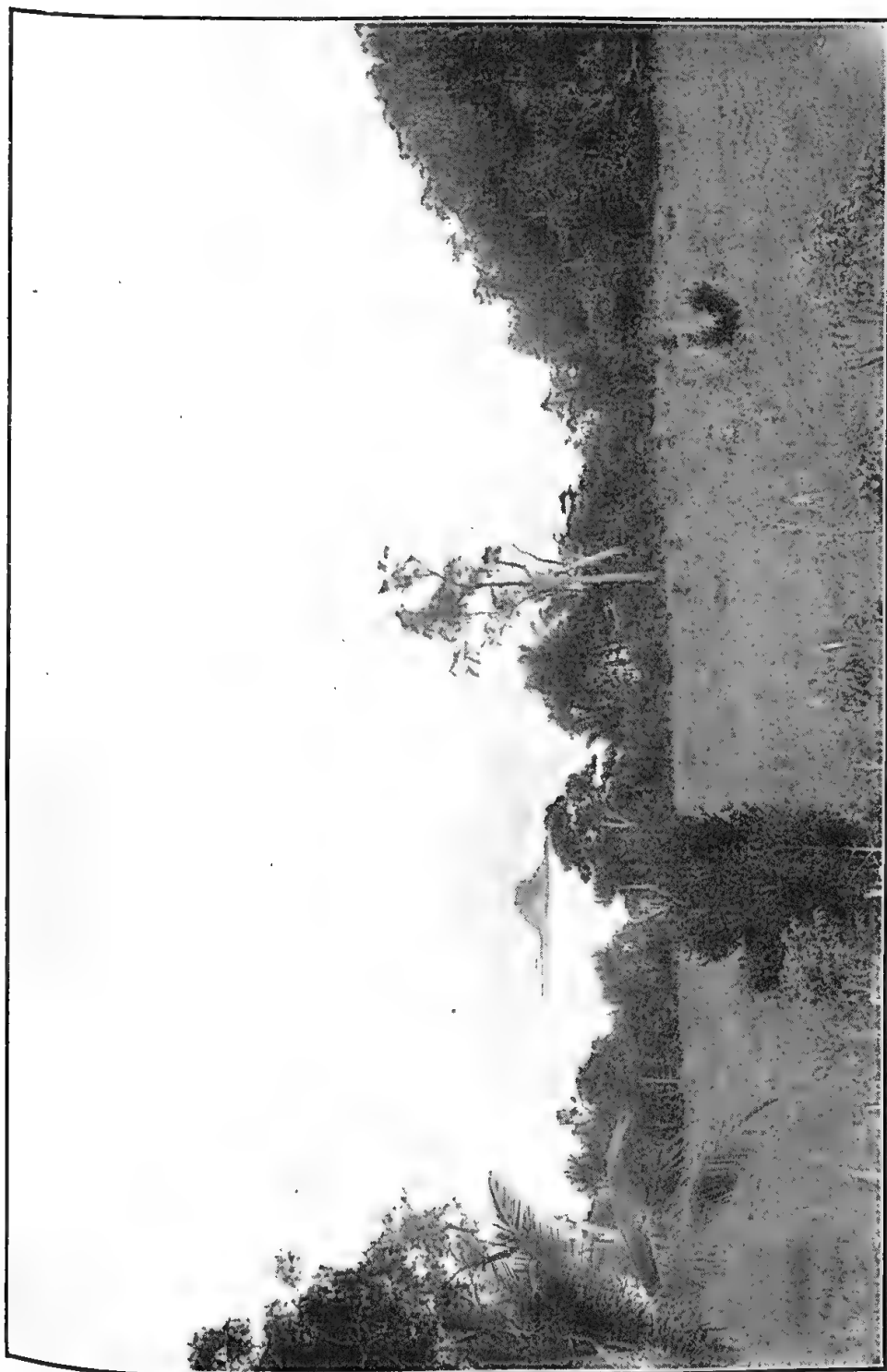
Edmund James Banfield, popularly known as "The Beachcomber," was perhaps the most picturesque figure among members of the Royal Australasian Ornithologists' Union. As the lord of a delectable isle lying in the seas of our tropics, and the author of three fascinating books dealing with his island life, he achieved fame extending far beyond the confines of the Commonwealth. Synchronically, he did much towards elucidating the life-histories of some of our most brilliant birds, and by his ceaseless emphasis of their charm and economic value helped largely to create the healthy spirit in ornithology that has animated Queensland in recent years. Apart from this consideration, Mr. Banfield's good citizenship was evidenced in many ways, notably in his championship of the qualities of our Northlands, and in the fact that he was an ever-present help in time of trouble to lonely settlers on the adjacent mainland. For all his love of freedom and ease, "The Beachcomber" was no mere lotus-eater. Those who have had the pleasure of visiting him

in the home which he so rarely left—among them several members of the R.A.O.U.—will bear witness to the fact that he was seldom idle, that he was astonishingly energetic for a man of his years, and that his mind was as active as his body.

Born in Liverpool (England) in 1852, E. J. Banfield came to Australia at an early age. His father, the late J. W. Banfield, took up a newspaper in Ararat (Victoria), and the young man became attached to the printing trade. Thence he went to New South Wales, and after working on newspapers in the Mother State, passed on to Queensland. For several years he did journalistic work on the Townsville daily *Bulletin*, and in that capacity became closely associated with the late Sir Robert Philp, then member for the district, and later Premier of Queensland, and also Sir Alfred Cowley, then member for the Herbert, and later Speaker of the Queensland Assembly. With Sir Robert Philp, Mr. Banfield toured much of North Queensland, experience that probably assisted in fixing his affections on the "free spaces" of the tropics. Towards the close of last century, the journalist's health gave way, probably through over-work, and his life was in danger. Indeed, when he and his devoted wife sought out an island home, it was in the belief that such experience would necessarily be of only short duration.

Dunk Island is one of a numerous group, lying immediately to the north of the noble Hinchinbrook Island. Rockingham Bay, which lies almost opposite, figures prominently in the ornithological history of Australia. It was fitting, therefore, that the district should give hospitality to yet another devotee of Australian birds. Mr. Banfield did not begin his studies immediately, of course. He was ill for many months. Gradually, however, strength returned to him, and he began to take an intelligent interest in the play of Nature on the isle, in the welfare of the blacks of the locality, and in fitting out a permanent habitation for Mrs. Banfield and himself. So the years passed.

Intermediately, this latter-day Stevenson wrote sketches for his old paper, the Townsville *Bulletin*, and its companion weekly journal, the *North Queensland Register*. From these writings was born his first book, one bearing the happy title *Confessions of a Beachcomber* (1908). Somewhat to the surprise of its author, this volume achieved popularity; its subject-matter was fascinating and the style was happy—obviously that of a man joying in the "next-to-Nature" life of a silver isle set in a silver sea. Thus came, in course of time, two further books on the same theme, *My Tropic Isle* (1911) and *Tropic Days* (1918). The first edition of each of these books is rare now; that of the *Confessions* has considerably appreciated in value. The only other mediums used by Mr. Banfield to relate his experiences and tell of the bird-friendships he had acquired were the *Emu*



Scene from Dunk Island, towards Purtaboi Islet, and the mainland of Queensland.

Photo by A. H. Chisholm, C.F.A.O.U.

NATIONAL MUSEUM MELBOURNE

and the *School Papers* of Queensland. In the latter he told children of the delights of bird-study; in the *Emu* he wrote delightful sketches of the ways of Shining Starlings, Spangled Drongos, and the Grey-tailed Swiftlet, all of which birds breed on the isle. The Swiftlets' cave, indeed, was one of the features—a carefully guarded feature—of Dunk Island. There is an attractive and valuable sketch upon the subject in chapter XX. of *My Tropic Isle*. Other birds which “The Beachcomber” held in particular affection, and upon which he wrote informatively, were the dainty Sun-bird and the handsome Nutmeg-Pigeon. One of his last achievements, and one which caused him to rejoice, was the securing of total protection by the law for the sadly-diminishing Nutmeg-Pigeons.

Mr. Banfield was active almost to the last. His bronzed figure was moving about the isle with accustomed vigour until a few days before his death. The end came suddenly, and it was not until three days after his death that the widow was able to attract the attention of the crew of a passing steamer. These visitors carried out the burial in the garden by the sea which “The Beachcomber” created, and in which he loved to watch the Sun-birds frisk. So ended a remarkable idyll extending over a quarter of a century. Mrs. Banfield is still upon the island; but whether she remains there or returns to the mundane world, and irrespective of what the future of the little possession may be, the name of Dunk Island will always be inseparably linked with those of “Beachcomber” Banfield and his gallant little wife.—A.H.C.

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“THE BEACHCOMBER’S” GRAVE ON DUNK ISLAND.

The big-hearted sailors buried “The Beachcomber” in a clearing on the northern side of his pretty home, a position he would have approved, for it overlooks the glories of the bay (Bramms) and the glistening beaches of Purtaboi (or Mount Island). In the distance, across blue water, the bold heights of Bellenden Ker and Bartle Frere rise skywards, while the great main range swings defiantly north and south. In the immediate foreground rest adjoining isles, “green to the drowsy foam,” while close at hand the tiny mountain streamlet gurgles cheerily through a wilderness of fern and scrub. Swamp Pheasants (*Coucals*) boom throatily on the flat, and Scrub Hens (*Megapodes*) querulously greet the coming and going of the days. Yellow-crested Sun-birds flit happily past, and later Nutmeg-Pigeons will croon sleepily, and there will be a riot of mango blossoms, and the soporific hum of bees, and at peace amidst it all lies “The Beachcomber,” sleeping soundly, while breezes come and go, and fleecy-crested seas fall ceaselessly on the golden beaches. — “Ceatus,” *North Queensland Register*, 11/6/23.

A NOTABLE COLLECTOR—ROBERT GRANT.

By A. J. Campbell, C.M.B.O.U., Etc.

The late Mr. Robert Grant, who was for many years taxidermist and collector of the Australian Museum, Sydney, passed away on March 8th, 1923, in his 69th year.

Robert Grant was born at Holytown, Lanarkshire, Scotland, and at an early age showed a great love for Nature. After school and on Saturdays he roamed the woods to listen to the song of birds and observe their habits. He soon became the idol and wonder of the villagers for his knowledge of local birds, and he could skin and stuff birds and mammals as in a manner born. Young Grant's abilities became known to county noblemen, including the Duke of Hamilton, who gave him the freedom of their estates and often commissioned him to set up groups of heads of boars and deer.

After having earned his living for a few years as a coal miner, Grant, at 18 years of age, was appointed game-keeper to the Duke of Hamilton—a congenial occupation which gave Grant a better opportunity to study in the open the fauna of the estate. Being of exceptionally fine physique Grant had no difficulty in holding his own against poachers, until the call to the wilds of Australia arrested him, and he eventually arrived, with his father's family, in Sydney Harbour in April, 1879. He settled down at Lithgow, where once more he became a miner. After work on summer eves and during leisure hours he was always in the bush, then in its virgin state, with game abundant, tramping for miles studying and collecting specimens, many of which are for ever preserved in the "H. L. White Collection," National Museum, Melbourne, Mr. White having acquired the Grant collection.

In 1885 Grant's abilities as collector and taxidermist came under the notice of the then curator of the Australian Museum (Dr. E. P. Ramsay), who commissioned Grant to make a collection of the local fauna for that institution. Two years later Grant was commissioned for another collecting trip further afield. Accompanied by his wife, Grant joined E. J. Cairn on a pioneering expedition for the Museum, to the Bellenden Ker Range, North Queensland. As a coincidence in name, the party made Cairns their base, and the local scrub a preliminary collecting ground, among the sun-birds and Scarlet Honeyeaters.

Later, by arrangement, a string of eight pack horses, with three others to ride, arrived and the party travelled inland over the ranges; through dense forest with trees bedecked with orchids; now in scrub where palm and tree fern vied with each other for graceful figure, here giant fig-trees with buttressed roots, there noble kauris with cylindrical barrels 80 feet without a branch, and many other sylvan sights beguiled the way. Every part of the track was of interest, not to mention dangerous, for the four days and nights of travel. Many times members of the

party had falls. On one occasion Mrs. Grant was lifted from her saddle through her dress being caught by a limb of a tree, which prevented her from being hurled over a precipice hundreds of feet to the bottom.

The first camp was made at Boar Pocket, near Atherton. The blacks being cannibals, were treacherous, and as yet had come into contact with few whites; in fact, Mrs. Grant was the first white woman the blacks had seen, and she was deemed a curiosity to the native mind. However, by tactful methods, a state of good fellowship was maintained, and the dusky dwellers of the scrub were instrumental in bringing many rare specimens to the collectors' camp, including tree-climbing kangaroos (*Dendrolagus lumholzi* and *D. bennettianus*). These unique animals were the first ever brought to Sydney. The rare striped opossum (*Dactylopsila trivirgata*) was also collected. On return to Sydney the general collection was found to be large and varied, with many specimens now too scarce, including the slender Native Cat (*Dasyurus gracilis*) and a small Flying Opossum (*Petauroides*). Among the birds collected were various Fruit-Pigeons, the Red-tailed Black Cockatoo (*Calyptorhynchus banksi*), a new variety of the Crimson Rosella (*Platycerus elegans nigrescens*), Fern Wren (*Oreoscopus gutturalis*), Little Tree-creeper (*Climacteris minor*), Victoria Rifle-bird (*Ptiloris victoriæ*), Tooth-billed Cat-bird (*Scenopoeetes dentirostris*), and many graceful and beautiful Honeyeaters. The first nests and eggs of the unique "Robin" (*Heteromyias cinereifrons*) were also found.

In 1888, Grant was engaged to accompany E. J. Cairn and Harry Shaw (representing the Sydney "Morning Herald") on an expedition down the rivers Darling and Murray, from Bourke to South Australia, in an open boat. The party started from Bourke on their adventurous undertaking, but, owing to a severe drought, the river became unnavigable, and after proceeding 300 miles the boat was abandoned and the collectors walked back to Bourke, where three months were spent collecting locally. The result was a good assortment of inland fauna and natives' implements. In the latter part of the same year Grant, together with Mrs. Grant and Cairn, were again despatched to North Queensland, and a camp formed at Mount Bartle Frere, Herberton District. Owing to its being monsoonal season, this trip, although not as successful as the former one to Queensland, nevertheless, the results were gratifying.

In 1889 Grant, with his wife, was despatched to the Bellenger River and Dorrigo Scrubs to make collections for the Chicago Exhibition. Subsequently trips were made to several stations in the interior, to the Cambenarra Mountains, and other localities. At the Bellenger River the Eastern Scrub Bird (*Atrichornis rufescens*) was procured.

Subsequently Grant was transferred to the indoor staff of the Museum, and on the death of J. H. Thorpe was appointed taxi-

dermist, which position he held till, owing to ill-health, he voluntarily retired in 1917, after 30 years of service. Grant's skill as a taxidermist is amply illustrated in the exhibits in the galleries of the Australian Museum, while the fact that he was kept so long in the field was a testimony to his bush-craft and his knowledge of birds and mammals and their habits. His many field notes of the former embellish the "Special Catalogue No. 1—Nests and Eggs of Birds Found Breeding in Australia and Tasmania," by the late A. J. North.

In a curious way, without spending powder and shot, Grant was the discoverer of a new Bird of Paradise. Some years ago he received several specimens of Birds of Paradise to set up. In the series he noticed three birds different from any he had seen, and brought them under the notice of the Ornithologist, the late Mr. A. J. North, who at once recognised the species as new to science and described it in *The Victorian Naturalist* (Vol. XXII., p. 156), and named it in honour of the late collector (*Paradisca grantii*).

Notes

In *Emu*, ante, p. 76, Mr. Gregory M. Mathews draws attention to Gould's "North-West Coast of Australia," and incidentally mentions my name in connection with some queries which I raised. It should, however, be stated that the instances referred to in Mr. Mathews' last note were not among those queried by me.—A. J. Campbell, Box Hill (Vic.), 8/8/23.

ANNUAL CONGRESS.

The State Secretary for Tasmania and the Hon. General Secretary would be glad to receive, as soon as possible, names of those members who propose to attend the Annual Congress in November. The State Secretary will probably be absent from Hobart from 9th-17th October, so it is requested that all enquiries be forwarded before the 9th inst.

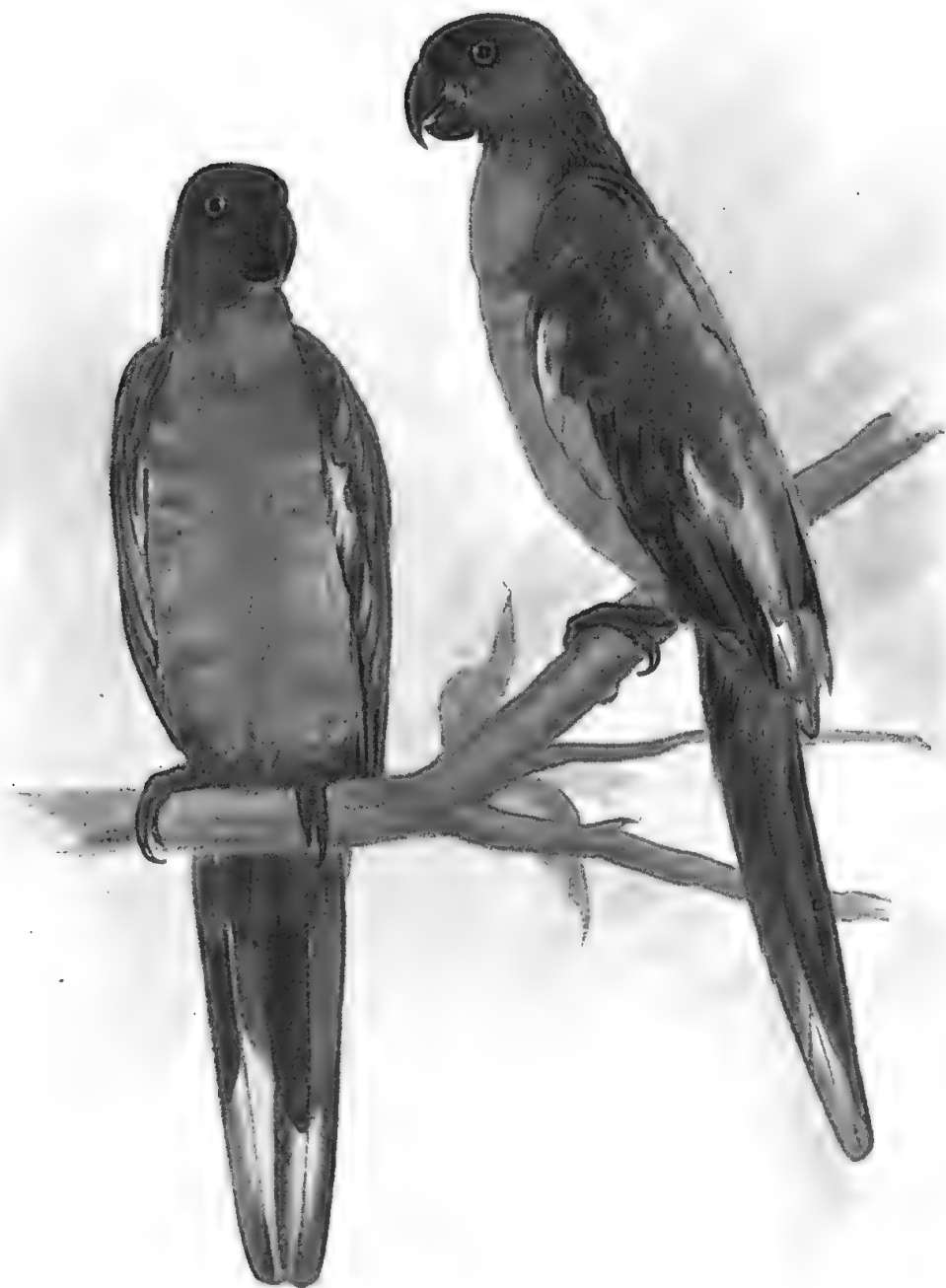
Enquiries concerning railway fares, concession tickets, etc., can be obtained from the branch offices of the Tasmanian Government Tourist Bureau in each State.

Members intending to join the Camp at Adventure Bay are particularly requested to notify the State Secretary immediately, in order to facilitate arrangements for the management of the Camp.

It is expected that a large and representative party will leave Melbourne on Friday, November 2nd, to attend the Annual Congress and Camp-out at Hobart and Adventure Bay.

The date of publication of this issue was October 1st.

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Heterochrosis in the Crimson-breasted Parrot.

The Emu

Official Organ of the Royal Australasian Ornithologists' Union

"Birds of a Feather."

VOL. XXIII.]

7TH JANUARY, 1924.

[PART 3

Heterochrosis in the Crimson-Breasted Parrot, *Pyrrhulopsis splendens*.

By CASEY A. WOOD, M.D., M.B.O.U., M.A.O.U.,
Chicago, U.S.A.

Colour metamorphoses in parrots have long been recognised by zoologists, and the alterations, both congenital and acquired, seem to follow definite rules to which there are few exceptions. As the writer has observed a well-marked example of deviation from the usual chromatic changes, it may be interesting to report it, together with a drawing in colour of the bird itself by a careful and competent New Zealand artist, Mr. Cedric Bulling.

The writer, who has examined about a hundred of the larger Fijian parrots, had his attention drawn, some months ago, to the presence in the pectoral plumage of a parrot from Kandavu—an island that furnishes practically all the supplies of the Crimson-breasted Parrot (*Pyrrhulopsis splendens*) for cages—some yellow spots. These occurred as scattered, buffy maculations affecting the free half of the plume. At the time these alterations, though evidently abnormal, were not regarded as sufficiently widespread or plain enough to warrant further enquiry. Shortly afterwards a second example appeared in a bird about three years old, with rather lighter green upper parts than the typical Kandavan species. The back showed a few *light orange* spots; in front there were more numerous *yellowish* maculations, and in places the red feathers were wholly suffused with yellowish.

This individual was certainly smaller in all dimensions than the ordinary adult female. Applying the vulgar test* of sex—size and shape of the head—the bird was probably a male, and on repeated (estimated) measurements, is less than 16 inches in

*This method of diagnosis, uniformly adopted by Fijian aviculturists, is based upon the observation that adult male birds have distinctly *flat-crowned* heads; females, on the contrary, definitely *round* heads. So far as the present writer has tested it, the finding is correct.

length. An important character is a well-marked *orange* tuft of uropygial feathers. This parrot was in the best of health, and the present owner had had him under observation for more than two years.

He was of an affectionate disposition, and proved to be an excellent conversationalist. The colour changes have been closely followed since they began to show on the bird's breast and back two years before. Since that date they have slowly increased in size and numbers. The tail and wings are as yet unaffected by the xanthochroism.

The individual pictured in the coloured plate has the yellow and orange markings more widespread and more fully developed. This parrot was brought from Kandavu as a fledgling less than a year ago. The immature plumage began to show the colour alterations first on the back; they then spread rather equally to the wings, abdomen and tail. The eyes are reddish brown; the mandibles present the normal black colour with the lighter, greyish base of a young bird. The general coloration can now be called yellow suffused with green. The hind-neck and back are covered with about an equal number of light green and yellow feathers, but in the upper tail coverts yellow predominates. Several of the primaries have both webs almost completely white, and three rectrices have lost most of their blue coloration, one being nearly white, the other two ashy grey. In the opinion of the owner, who is much interested in the peculiar plumage of his bird, the colour changes in the upper surface of the body have recently advanced so rapidly that in a few months, if the rate of change continues, he will have on his hands a yellow and white parrot.

The chromatic alterations in respect of both colours have always shown themselves at the feather tip, thence advancing uniformly to the base. As in the case of the other two subjects, this bird has always been healthy and lively, of a good disposition, and a good talker.

Without attempting to discuss this case of mixed albinism and xanthochroism, a task already undertaken by Deane, Toppan, and others, as regards birds in general and by Gadow, Penzeln, and Meyer, in respect of heterochrosis in the parrot family, the problems that arise when two or more different processes are taking place in the same individual are doubly difficult of explanation, especially when the subject is (or is to all appearances) free from any other form of disease.

The writer would be much interested to learn if any of his colleagues have studied similar cases of double heterochrosis in any of the parrot genera.

Royal Australasian Ornithologists' Union. 22nd Annual Congress

The Twenty-second Annual Congress of the Royal Australasian Ornithologists' Union opened at the Tasmanian Museum, Hobart, at 10 a.m., Tuesday, November 6th, the President, Dr. J. A. Leach, presiding.

The President introduced the Hon. the Chief Secretary for Tasmania (Hon. J. A. Guy), and in doing so, dealt with the work done by the Union, with regard to fauna preservation.

The Hon. the Chief Secretary, in opening the Conference, extended a welcome to the delegates on behalf of the Government, and wished them a very successful conference. A vote of thanks to the Minister was moved by Mr. E. Ashby (S.A.), seconded by Mr. W. F. Gates (Vic.).

Greetings were received from Mr. Barnard (Q.), Mr. Alexander (Q.), and Major E. A. Le Souef (W.A.).

Apologies received from Capt. White (S.A.), N. Cayley (N.S.W.), A. J. Campbell, Esq. (Vic.), Dr. L. W. Crowther (T.), Col. Evans (T.), and S. Dove, Esq. (T.).

The minutes of the last annual meeting having been printed in *The Emu*, were taken as read, and confirmed.

The Hon. Gen. Secretary (Mr. J. Cross) read the Annual Report, also the balance-sheet presented by Mr. Z. Gray. These showed a net gain of 37 members, and a satisfactory credit balance.

Moved by Mr. Butler that this Congress congratulates Mr. Gray on the success he has attained as Treasurer and Secretary, and also thanks him for his past efforts on behalf of the Union; and that it causes an entry to this effect to be made in the minutes. The motion was seconded by Mr. Cross, supported by Mr. Lord, and carried.

After some discussion, it was moved by Mr. Ashby, and seconded by Mr. Hall, that 50 surplus copies of *The Emu* be printed beyond the number of subscribers.

Moved by Mr. Burbury, and seconded by Mr. Reid, that a vote of thanks be accorded Mr. Parker, for giving the use of the Union's Room, 376 Flinders Lane, Melbourne. Carried.

The Annual Report and Balance Sheet were then received and adopted.

The Editor reported that, in spite of the great increase in printing and publishing costs, the arrangements just made would enable *The Emu* to be kept up to standard in size and quality at a considerable reduction in costs.

A vote of thanks was passed to the Editors of *The Emu* for their work.

The election of officers then took place, with the following result:—*President*, Dr. J. A. Leach, C.M.B.O.U., C.F.A.O.U. (Vic.); *Vice-Presidents*, Mr. A. H. Chisholm (N.S.W.); Mr. J. A. Ross (Vic.), Mr. W. B. Alexander (Qld.); *Hon. Gen.*

Secretary, Mr. J. Cross, B.A.; *Hon. Asst. Sec.*, Mr. D. Dickison; *Hon. Treasurer*, Mr. Z. Gray, L.C.A.; *Hon. Librarian*, Mr. F. E. Wilson, F.E.S.; *Hon. Editor*, "Emu," Dr. J. A. Leach; *Hon. Asst. Editor*, "Emu," Mr. R. T. Littlejohns; *Curators*—(a) *Skins*, Mr. E. P. Macleay, (b) *Eggs*, Mr. J. A. Ross, (c) *Photos*, Mr. S. A. Lawrence; *Hon. Press Correspondent*, Dr. Brooke Nicholls; *Hon. Auditors*, Mr. James Barr, F.C.P.A., Mr. James Hedding. *State Secretaries*—New South Wales, Mr. N. W. Cayley; Queensland, Mr. G. H. Barker; South Australia, Capt. S. A. White, C.M.B.O.U.; West Australia, Mr. W. H. Loaring; Tasmania, Mr. C. E. Lord, F.L.S., New Zealand, Mr. W. R. B. Oliver, F.L.S. *Council*—*Victoria*, Mr. C. Barrett; N.S.W., Dr. D'Ombraïn, Messrs. A. S. Le Souef, P. A. Gilbert; Qld., Mr. H. A. Longman; South Australia, Mr. E. Ashby, M.B.O.U., Prof. J. B. Cleland, Mr. J. Neil McGilp; West Australia, Mr. Justice T. P. Draper, Mr. P. T. Sandland; Tasmania, Mr. H. Stuart Dove, F.Z.S., Col. T. M. Evans; New Zealand, Mr. R. H. D. Stidolph, Mr. W. W. Smith. *Ex-Presidents, ex-officio Members of Council*, Sur.-Gen. Sir C. S. Ryan, Messrs. C. A. Barnard, A. J. Campbell, A. H. Mattingley, R. Hall, J. W. Mellor, A. F. B. Hull, and Dr. W. MacGillivray.

Mr. Gilbert's notice of motion, "That, in any State where the R.A.O.U. has an active branch, a Vice-President be elected for that State, who shall be a member of the branch, and who shall reside in the State for which he is elected, and, further, where a branch of the R.A.O.U. is in affiliation, the Vice-Presidency shall apply only to the R.A.O.U. members of that affiliation," was then considered. It was pointed out by several members that various interpretations might be placed upon the wording of this motion, and, after discussion, the following motion was carried:—"That, in view of the various interpretations placed upon Mr. Gilbert's motion, together with Mr. Chisholm's election as Vice-President, consideration of the matter be deferred until the next general meeting of the Union, the Council to give consideration to the matter in the meanwhile."

Mr. Gates moved, Mr. Ashby seconded, the adoption of the First Annual Report of the New South Wales State Branch, in affiliation with the Royal Zoological Society of N.S.W. (read by Mr. Cross). It indicated a very live attitude on the part of the N.S.W. members, and was forwarded by the State Secretary, Mr. N. W. Cayley.

The State Secretary for Queensland (Mr. G. H. Barker) forwarded greetings to the Conference, and an invitation for the 23rd Annual Conference to be held in Queensland.

Mr. A. S. Le Souef moved (by letter), "That the R.A.O.U. become a member of the Society for the Preservation of the Fauna of the Empire, with an annual subscription of 10/-." Seconded by Mr. Hall. The motion was carried.

Mr. Lord read Mr. A. J. Campbell's paper on "Domestic Cats Gone Wild versus Bird Protection." This paper appears elsewhere.

Mr. E. A. Ashby read a paper entitled, "Discussion of Causes Contributing to the Apparent Rarity of Certain Species of Australian Birds, with Suggestions as to the Best Means of Adequate Protection," in which he moved:—"That our official representatives in each State be requested to take the necessary steps to insure that the resolution respecting reserves passed last year, be adopted as part of the policy of each of the State Governments, and report what has been done to next Congress." Seconded by Mr. Robert Hall, an ex-President of the Union, and carried. This paper is printed in part in this issue.

In continuing the discussion on Mr. Ashby's paper, Mr. Ashby moved further: "That a small committee be appointed to work out some recommendations which have for their object the preservation of unburnt blocks of scrub in all districts where bush exists." Seconded by Mr. Burbury, and carried.

Moved by Mr. McGilp, and seconded by Miss Fletcher, that Mr. Ashby be elected as convener of the committee, and the Council be asked to secure the election of one member for each State to work out recommendations for the next Conference. Carried.

Messrs. Lord, Ashby, and Reid spoke on the game laws of Tasmania, etc., and Mr. Lord read portion of the Tasmanian Police Department's Report, showing the good work done in fauna preservation.

Mr. Lord read a report on the return of skins taken during the last open season. This showed that over one million skins of marsupials had been registered as taken in Tasmania in an open season of about three months.

Mr. Gates spoke on the State Committee (Vic.) re the export of Australian birds.

Mr. McGilp moved, and Mr. Ashby seconded, that Clause C1* of the recommendations of the Victorian Advisory Committee be held over for further discussion at the Camp. Carried.

Mr. Lord moved, and Mr. Gates seconded, that Clause B7 of the recommendations of the Victorian Advisory Committee be referred to the Tasmanian Attorney-General, the wording to be altered in order to make it a recommendation to the Tasmanian Government to appoint a Tasmanian State Committee. Carried.

Mr. Hall's paper on "The Relationships of Tasmanian Birds" was read. It appears in part in this issue of *The Emu*.

Miss Fletcher read her paper, entitled "Does Tasmania Possess a Second Blue Wren?" Specimen nests and eggs helped to sustain her argument that such a bird does exist.

Further papers were adjourned until members were in camp. After discussion on the matter, Mr. McGilp moved that the matter of the locality of the next Conference be left to the

*That no export for private profit be permitted.

Council for further investigation. Seconded by Mr. Ashby, and carried.

At 12.15 Mr. Cleames joined the Conference to discuss the matter of the resuscitation of the Gould League. Moved by Mr. Cleames, and seconded by Mr. Gates, that the Union approach the Education Department, and see what can be done in connection with this matter. Carried. The deputation was subsequently received very sympathetically. It is probable that Bird Day will be celebrated annually in Tasmanian schools. The Director of Education, Mr. Brooks, promised active support.

Moved by Mr. Lord, and seconded by Mr. Gates, that it be a recommendation to the Commonwealth Government that a Biological Survey of Australia be inaugurated by the Institute of Science and Industry, and that all scientific and natural history societies be asked to assist the Institute in this matter. Carried.

Votes of thanks were passed to the Trustees of the Tasmanian Museum, the Council of Royal Society of Tasmania, the Tasmanian Field Naturalists' Club, the National Park Board, the Press, and those who had assisted in making the Congress so marked a success.

Moved by Mr. Hall, and seconded by Mr. McGilp, that a vote of thanks be passed to Mr. Clive Lord for his work in reference to the Conference, and as State Secretary for Tasmania.

The business of the Congress was resumed at the Camp-out, on Tuesday evening, 13th November.

The regulations, guiding principles, etc., of the Advisory Committee for Victoria were discussed at length. Finally, all sections but C 1 were agreed to, and it was carried that this particular section should be held over for another year for further consideration. The sections agreed to are to be sent to the representatives of the Union on each State Committee.

Mr. McGilp was nominated to act on the South Australian Advisory Committee, and another member, to act as his deputy, is to be selected later.

Mr. Sharland's paper on the Early Nesting of Birds round Hobart, was well received. It appears elsewhere.

A paper, by Mr. W. B. Alexander, was read by the President. It had reference to White's *Journal of a Voyage to New South Wales*, published in 1790. Mr. Ashby moved, and Mr. McGilp seconded, a motion, that the Check-list Committee should consider the suggestions contained in Mr. Alexander's paper.

A paper on the Bulbul, by Dr. McPherson, of Sydney, was read, and a motion was carried, that the Customs Authorities should be asked to give consideration to the damage done by this bird. It is recommended that drastic action be taken to prevent this bird from establishing itself in Australia.

A paper on Peculiar Nesting Sites of Birds on the Nullarbor

REPTILES AND AMPHIBIANS



Upper: Nest of Sea-Eagle in tall gum (in centre of picture) at Adventure Bay-
Lower: Party of Naturalists and Ornithologists at National Park.

Photos. : Lower by Miss A. Reid ; Upper by M. S. R. Sharland.

Plain was read. It was forwarded by Mr. Ellis Troughton, of the Australian Museum, and interested members.

The report of the Check-list Committee was presented by the President, who outlined the principles adopted by the Check-list Committee in their classification of Australian birds, and intimated that the final draft of the check-list would soon be completed, and submitted to members for their consideration and criticism. General approval of the draft list was expressed, and the hope was expressed that the check-list would be published in its present complete form.

Members preferred Honeyeater as a vernacular name to Honeybird.

Interest was expressed in the Scheme of Classification of Australian Birds, a rearrangement of orders and families, as proposed by Messrs. Mathews and Iredale, and modified by the Check-list Sub-committee, Mr. Alexander and Dr. Leach.

This completed the formal business of the Congress.

The 22nd Congress of the R.A.O.U.

A Mainland Point of View.

By JOHN CROSS, B.A., Hon. Gen. Sec., R.A.O.U.

The mainland delegation to the 22nd Congress of the R.A.O.U. left for Tasmania on Friday, 2nd November. South Australia had seven representatives, and Victoria three. Wherever the next Congress is held, it will be a reproach to the Union if the attendance is not considerably better than it was at this one. The recent Pan-Pacific Congress in Melbourne and Sydney prevented many members meeting again in Hobart. All honour is due to the South Australians, who may be said, by virtue of their numbers, to have made the Congress.

The "Nairana" was not clear of the Heads before the compilation of the bird-list (published elsewhere) began.

Arrived at Launceston, all had a look at the famous Cataract Gorge, and then, either by train or by car, moved on to Hobart, which was reached on Saturday evening, 3rd November. The welcome received there was a foretaste of that extended to the delegates throughout their stay. Our Tasmanian friends vied with one another in making the visitors feel at home, and compassed them about with observances.

In the evening there was an informal gathering at the Museum to give opportunity for introductions and conversation, and so to prepare the way for the serious business of the Congress. Thus early the visitors received further assurances of the pleasant times in store for them.

On Monday, 5th November, the delegates were taken by train to the National Park, of 38,500 acres, and served with lunch and afternoon tea, in surroundings strongly reminiscent of the Marysville district, in Victoria. The immense gum trees, the dense undergrowth, the thick-clustering ferns, the clear-

flowing streams were a delight to see. Tasmania is fortunate in possessing, within fifty miles of Hobart, such a retreat where the native fauna and flora may enjoy absolute freedom from molestation.

The Congress was held in Hobart on Tuesday, Wednesday and Thursday, 6th, 7th and 8th November. There was a good representation from Tasmania, including Miss Fletcher, famous for the keenness of her bird observations, and at its close there was general agreement that the Congress had been of a distinctly educational and helpful character. The explicit aim of the Union, to popularise the study and protection of native birds, was certainly fulfilled in the meetings of the Congress. One felt that bird protection is on a rising tide throughout the Commonwealth.

The meetings were conducted in the fine room of the Royal Society of Tasmania at the Museum, where the delegates worked under ideal conditions for reference and comfort.

On Tuesday evening, 6th November, under the auspices of the Royal Society (Mr. Rodway, C.M.G., the Government Botanist, occupying the chair), the President, Dr. Leach, delivered his lecture on the Birds of Australia. Though there were strong counter-attractions, the audience was a large one, and the fine series of slides, and the Doctor's lucid and interesting exposition, captured eye, ear, and imagination. A *conversazione*, with refreshments, followed in The Art Gallery.

On Wednesday evening, 7th November, Mr. Ashby gave his well-illustrated and interesting lecture on the Mound-Building Birds of Australia, and then let the large audience see his beautiful collection of Humming-birds, the glories of whose plumage beggar description.

On one of the days of the Congress, a mayoral reception was arranged, and friendly words were spoken by Hobart's chief magistrate. Every day free use was made of the Museum collections to assist discussions regarding birds.

Another day the delegates were taken to see the newly-formed Zoo, and were entertained there to afternoon tea. Hobart is to be congratulated on its Zoo. Nature and art have combined to provide an environment in which the captive creatures appear to be quite happy. The native fauna of Tasmania is very well represented, and the visitors paid special attention to two specimens of the now rare marsupial wolf, as well as to several specimens of the more famous "Devil."

In addition to these and other excursions and entertainments arranged for the visitors, a lavish private hospitality was exercised, and the problem finally became one of trying to escape being killed by kindness.

On Friday, 9th November, the camp party of thirteen (afterwards increased to fourteen), with the cook and his assistant, left with some misgivings, on account of the rain, for the camp at Adventure Bay. The steamer, after a run of some thirty



Upper : R. Reid (T.), J. N. McGilp (S.A.), F. Parsons (S.A.), W. F. Gates (V.), W. Sanders (S.A.), C. Lord (T.)
Middle : E. Ashby (S.A.), J. Cross (V.), M. S. R. Sharland (T.)
Front : Mrs. McGilp, Miss Sanders, the President (Dr. Leach), Mrs. Parsons, Miss A. Reid, (T.)

The Party ready to leave Camp for Hobart.

miles, landed the party at Allonah, whence conveyances carried us to Adventure Bay. The weather during the camp-out was, for the most part, ideal, and the conditions under which the campers lived were sufficiently rough to suggest camp life, and sufficiently luxurious to reconcile the sybarites to it. Adventure Bay is delightfully situated on the east side of Bruny Island, and possesses many historical associations. There was no lack of occupation. The scenery, the bird life, the shore life, the life of the community, all helped to provide interest and to charm. On two evenings Dr. Leach and Messrs. Clive Lord and Sharland, by request, addressed interested audiences in the local hall on the early history of Adventure Bay, the National Park, and its wild life, and particularly on Birds. The lantern views served to show *inter alia* with what infinite patience and resource the bird photographer stalks his game.

The camp ran very smoothly, thanks largely to the organising skill of Mr. C. Lord, the Tasmanian Secretary of the R.A.O.U., and it was with feelings akin to regret that, on Thursday, 15th November, the party came away. All had found what they were looking for, and those whose knowledge of bird life was small had at least refreshed tired spirits with the exceeding loveliness of the Tasmanian bush. Everywhere there was beauty of form, and flowers, shrubs, and trees rioted in colour. It needed no technical knowledge whatever to find delight in the song of a harmonious thrush, and that of an olivaceous whistler alternating from a clump of trees.

On Friday, 16th November, a large gathering at the Hobart Zoo enabled the visiting delegates to say good-bye to the many friends and members of the R.A.O.U., who had spared no pains to ensure that the Hobart session of 1923 ranks high in the annals of the Union. It also enabled the President to pay a well-merited tribute to the local State Secretary, Mr. Clive Lord, who so efficiently organised the Congress and Camp-out.

The Victorian delegates returned *via* Burnie, on Saturday, 17th November, while the South Australians stayed until the following week, doing some independent and fruitful bird study at Scottsdale, in the N.E. of the island.

On Friday, 23rd November, Mr. and Mrs. McGilp and Mr. and Mrs. Parsons (S.A.) and Mr. and Mrs. A. H. Chisholm (N.S.W.) were met at lunch at the Melbourne Museum by a party of Victorian ornithologists, and time was found to see something of the Botanical Gardens, and of the Museum.

One may conclude by saying (at the risk of repetition) that our Tasmanian friends left nothing undone that could in any way minister to the comfort and entertainment of the visitors from the mainland, that the Island State appeared to be exceedingly rich in natural resources, and that whatever temporary depression there may be, its future prosperity should be assured.

BALANCE SHEET

RECEIPTS.

Subscriptions (374), 1923	£392	15	0
Arrears (6), 1921	6	18	0
(25), 1922	26	2	0
Advance (48), 1924	51	1	0
Life	10	10	0
		£487	6 0
Sales— <i>Emu</i> , £53/17/-; Boxes, £7/10/-; Shelf, 7/6; Covers, £4/1/7; Photo Club, £11/5/6; Interest, £5; Blocks, £9/6/6; Reprints, £3/9/-; Lecture, £2/15/6; Index, £16/10/-; Exchange, £5/7/10		119	10 5
Colour Fund—Donations, £21/19/-; Advertising, £3/3/-; Plates, £17/5/4		42	7 4
Trust Fund, Interest		60	0 0
		£709	3 9
Cr. Balance, 1st July, 1922.		58	2 0
		£767	5 9

ASSETS, 30/6/23.

National Bank, Credit Balance	£37	7	4
Subscriptions—Arrears	£52	10	0
Less Prepaid	51	1	0
		1	9 0
Library, Furniture, Specimens, etc.	913	17	6
Reserve Fund—Commonwealth 5 per cent. Bond..	100	0	0
Trust Fund—Commonwealth 6 per cent. Bond ..	1000	0	0
		£2052	13 10

Z. GRAY, L.C.A., Hon. Secty.

BROOKE NICHOLLS, Hon. Treas.

Melbourne, 1/7/1923.

YEAR ENDED 30th JUNE, 1923

EXPENDITURE.

<i>Emu</i> , Vol. 22—		
Printing	£440	7 6
Postage	18	7 2
Blocks	53	0 6
Colour Plates	14	17 6
Reprints	64	14 10
Patron's Copy	0	5 0
		£591 12 6
A/c Vol. 23—Blocks	16	0 0
Colour Plates	7	2 6
		23 2 6
		£614 15 0
Postage, £17/19/5; Printing, £6/8/5; Exchange, £5/6/9; Covers, £3/17/11; Typing, £5/3/11; Commission, £2/12/9; <i>Save Our Birds</i> , £5; Cable, £1/8/6; Adelaide, 15/6; Fee, 10/-; Cheques, 2/6		
		49 5 8
Room—Rent, £32/10/-; Light, £1/15/1; Cleaning, £5/4/-; Insurance, £3/4/10; Library, 3/10; Shelves, £23		
		65 17 9
		£729 18 5
National Bank, Cr. Balance, 30/6/1923		37 7 4
		£767 5 9

LIABILITIES.

Nil.

Audited and certified correct—
JAMES BARR, F.C.P.A.,
JAMES HEDDING,

22/9/23.

Hon. Auditors.

SECRETARY'S REPORT TO THE CONGRESS.

Ladies and Gentleman,—

I beg to present a report for the past year. The membership of the Union is as shown in the following list:—

	Life.	Ordinary.	Honorary.	Exchange.	Total.
Victoria	2	182	3	5	192
New South Wales ..	2	117	—	2	121
Queensland	—	52	—	—	52
South Australia ..	—	33	1	1	35
West Australia ..	—	17	—	—	17
Tasmania	1	27	—	—	28
New Zealand	—	18	—	—	18
British	1	21	—	3	25
America	1	17	3	6	27
Foreign	—	5	1	1	7
Grand Totals ..	7	489	8	18	522

During the year the Union has sustained the loss by death of seven of its members (of whom Mr. D. Le Souef, a foundation member and a Past President and Honorary Secretary, was one). Thirty-one others have resigned.

These figures show a net gain of 37 in our membership since the last report was presented, and may be taken to indicate increased public interest in the work of the Union.

Eight copies of *The Emu* are disposed of by Witherby's in London, and so the total circulation is 530 copies.

Council meetings have been held monthly, without a break, and have been well attended. While details of administration have necessarily occupied a good deal of time, the chief concern of the Council has been to do everything possible to preserve the native birds, and to prevent the importation of foreign species, which, in their new surroundings and changed conditions, might easily become pests.

As far back as January, Messrs. Lawrence, Littlejohns, and Mattingley were appointed a vigilance committee to exercise supervision over the exportation of birds and trade in birds.

And again in July, the Secretary was authorised to write to the Customs Department, strongly urging, on behalf of the Union—

- (a) That no export for private profit should be allowed; and
- (b) That export should be permitted only after inspection, and through recognised Zoological Societies.

Section 9 of the Business Sheet reads: "Report re Bird Protection and Game Laws," and under this head there will be opportunity for a full discussion. Sections 10 and 14 bear on the same matter. One's reading of the newspapers would seem to show that even yet our beautiful and rare native birds are trapped and sent abroad to a life of captivity, if they are fortunate enough to survive the miseries of the long and sometimes trying voyage.

Within the last few months the Union headquarters have been transferred from Temple Court to 376 Flinders-lane, Temple Court is being demolished to make room for a more modern structure. After making many inquiries, the Council was glad to accept the offer of the use of the present room, so kindly placed at our disposal by one of our newer members, Mr. Critchley Parker.

Inspired by motives of economy, the Council has recently put the printing of *The Emu* in the hands of Keating-Wood Proprietary.

It only remains to say that the future of the Union is in the hands of its members, and a continuance of their enthusiastic and loyal co-operation is assumed.

Z. GRAY, Hon. Sec.

ORNITHOLOGICAL SECTION OF THE ROYAL ZOOLOGICAL
SOCIETY OF NEW SOUTH WALES, AND NEW SOUTH
WALES MEMBERS OF THE ROYAL AUSTRALASIAN
ORNITHOLOGISTS' UNION.

Sydney.

First Annual Report.

Herewith I have much pleasure in tendering the report of the Committee on the operations of this Section during the year ended June 30th, 1923. The progress made during this period has been very satisfactory, and fully justifies the establishment of this Section. Seven ordinary meetings were held, with an average attendance of twelve. A Special Meeting was also held on 30th April, 1923, for the purpose of welcoming Dr. Casey A. Wood, an eminent member of the American Ornithologists' Union.

The membership has increased from 34 to 45, and this number should be greatly augmented when the members of the two affiliated Societies become better acquainted with the work and objects of this Section.

The combined success achieved by this Section in conjunction with kindred scientific societies in bringing about a cessation of the felling of trees for commercial purposes in National Park was most gratifying. This Section's thanks are due to these Societies and to the Press for their wholehearted support in having these operations stopped.

An attempt is also being made to bring about the better administration of the Birds and Animals Protection Act, 1918, and meetings of delegates from the kindred societies have been held. Mr. W. W. Froggatt, Government Entomologist, submitted the following suggestion, namely, the transfer of the Birds and Animals Protection Act, 1918, from the Chief Secretary's Department to the Agricultural Department, and the appointment of a purely honorary

advisory board, consisting of members of the scientific societies. As this suggestion, if agreed to by the two Departments mentioned, seemed to be a solution of the difficulty, a deputation was arranged for the 14th June to wait on the Chief Secretary to place the matter before him. The Chief Secretary and Acting Premier, Mr. Oakes, deputed his colleague, the Minister for Labour and Industry, Mr. Farrar, to receive the deputation on his behalf. The speakers at the deputation were Messrs. A. F. Basset Hull, F. Lynne Rolin, and A. H. Chisholm. After hearing the speakers, who explained the many advantages to be gained by the transfer and the appointment of an honorary advisory board, Mr. Farrar thanked the members of the deputation for the suggestions submitted, and stated that they would receive Mr. Oakes' personal consideration. Many of these suggestions he was personally in accord with, but expressed a doubt as to whether it was practicable to make the transfer.

If our efforts are successful, the members of the Section have every reason to congratulate themselves in having been instrumental in accomplishing two very important factors in the preservation of our bird life.

On 30th April, the usual monthly meeting was held at the Australian Museum, the trustees having kindly placed the lecture hall of that institution at the disposal of the Section. As an experiment, the public were invited. It proved successful, the hall being nearly filled. If similar evenings were held, say, every three months, I feel sure the result would be beneficial, not only to the members and public, but to the birds, as it would be the means of bringing the work of our members before the public, and enlisting their co-operation in our endeavours for the better protection of our native birds. Short lecturettes, illustrated with lantern slides, were given by Messrs. A. F. Basset Hull (Sea-birds), P. A. Gilbert (Honey-eaters), N. W. Cayley (Lyre-birds and Bower-birds), E. F. Pollock (Birds in Captivity), J. R. Kinghorn (Birds in Museums), and A. H. Chisholm (Children and Birds).

On Monday, 30th April, a special meeting of the Section was held to welcome Dr. Casey Wood, A.O.U., who brought fraternal greetings from his Union to the brother bird-men in Australia. A fine selection of bird pictures by Messrs. D. W. Gaukrodger, A. E. Keene, J. S. P. Ramsay, F. C. Morse, P. A. Gilbert, S. A. Lawrence and R. T. Littlejohns was shown by Mr. N. W. Cayley, who undertook to make up a representative collection for presentation to Dr. Wood to illustrate the lectures on Australian Birds he proposes to deliver on his return to the U.S.A. Dr. Casey A. Wood complimented the authors of the bird pictures on the excellence of their work, and said that they equalled anything he had seen elsewhere. He also thanked Messrs. A. F. Basset Hull, A. S. Le Souef, and E. Nubling for taking him to National Park, and introducing him to the Lyre-bird, Satin Bower-bird, and other interesting species, which he had expressed a wish to see in natural environments.

Owing to the great interest shown in the proceedings of this Section, it was deemed necessary to hold monthly meetings, at which short lectures will be delivered, and followed by a general discussion, the ordinary routine business to be carried out by the Committee.

On behalf of the Committee,

NEVILLE W. CAYLEY,

Hon. Secretary.

Domestic Cats Gone Wild *versus* Bird Protection.

By A. J. CAMPBELL, F.A.O.U., Melbourne.

(Read at R.A.O.U. Annual Congress, Hobart, Nov., 1923.)

Ladies and Gentlemen,—To begin, and, if I may be permitted to use a paradox, this is no "Wild-Cat Scheme."

At Adelaide, 1905, or 18 years ago, I brought this important matter before our Union (*vide Emu*, V., p. 201). "The voice of one crying the wilderness." The only response came from far-away America. There they are confronted with a similar evil, and I was asked what were we "doing in the matter." My melancholy reply was: "Nothing."

Four years ago, at Perth, I again ventilated the subject of cats in the press. The scribes saw only the humorous side of the question. Result: Comic cuts about old A.J.C. having relinquished legitimate ornithology, and prowling through the bush with a blunderbuss—after cats.

Now to the business of this paper, and let me quote a few independent records* concerning cats. Gerald F. Hill, Naturalist and Explorer, writes (*Emu*, XV., p. 73):—"In 1909-10, while collecting in the far north-west of Kimberley, I was surprised to find cats on the mainland and adjacent islands, where they had been liberated, no doubt, from passing, or visiting trepang and pearling craft. During a more recent expedition across the continent, I frequently saw these animals between Oodnadatta and Alice Springs, and through the Western MacDonnell Ranges. They were seen again in the Macarthur and Roper River districts, across to the Katherine, and northwards to the coast. There are obvious and practically insuperable difficulties in dealing with this pest in the great areas referred to, but in the more settled states the economic value of our fast-diminishing bird-life should justify drastic action, or, at least, serious consideration of the subject which, as Mr. Campbell remarks, will have to be faced sooner or later."

These potent remarks by Mr. Hill were called forth by an article, "Missing Birds," notably ground parrots (*Emu*, XIV., p. 167), in which I state:—"Would it not be well for members to unite to protect, or to aid in the protection of some of the fast-failing forms of our avi-fauna. In point of fact, is not the "protection of native birds" one of the chief planks of the Royal Australasian Ornithologists' Union? I would suggest that a committee be appointed to report on the wild-cat question in connection with the destruction of birds." I now, formally, do so again.

*I could multiply many instances from personal experience, if necessary.

Take another Explorer's record:—"Fowler's Bay to Cambridge Gulf," by R. T. Maurice, a daring and successful trip across Australia, about which there were no pæans sounded as with the ill-fated Burke and Wills' Expedition. Maurice's report was simply printed by order of the House of Assembly of South Australia, November 11th, 1904. We read at page 24:—"Signs of them (rabbits) were seen so far as Lake Amadeus, but generally more domestic cats than rabbits were seen, and these animals are now distributed right through the continent and are almost as universal as the dingo." This was in 1901.

The Wilkins Australia and Islands Expedition, under direction of the British Museum, and at present collecting in little-known parts of Northern Australia, reported trouble with wild cats.

A clipping from the *Melbourne Age* reads:—"A number of Red Cliffs blockers have been losing poultry, and at first foxes were suspected. A watch was kept at one place, and cats were found to be the culprits. Numerous domestic cats have been taken from Mildura and left on the fringe of Red Cliffs settlement in the mallee, where they have gone wild."

All of you will agree that an animal that will tackle a rooster is a fierce monster when considered in the balance with the smaller native birds. What hope have they in life?

In an article, "Why the Birds Should be Protected," by Mrs. F. Hobler (*née* Miss Barnard, of Coomoooolaroo), in *The Queensland Naturalist*, IV., p. 21, that lady states:—"The domestic cat gone wild is another set-back to bird-life. What numbers of birds do they devour, and the young ones have no hope of escape. The quiet, old Squatter-Pigeon, which, at one time, was so numerous, is now almost a bird of the past—in the Central District at least."

The Commonwealth Government (through the Minister of Customs, and in pursuance of our resolutions carried at Adelaide last year) has appointed committees in the various States to deal with the export of Australian birds (and mammals). I know a little about the Melbourne Advisory Committee, which possesses the brains of the city, in its line. It has formulated the most stringent regulations to control the exportation of such animals as are regarded as being in danger of extermination. So far so good. But, to be logical, ladies and gentlemen, what is the use of such stringent measures for the few specimens which may be brought to ship board, or obtained for collections, when the fox and the domestic cat gone wild, are chewing up the same species wholesale in the bush? I ask again, what are we, as a Union, going to do in view of our chief plank being the "Protection of Native Birds"?

Let us get back to some of the propositions in my original Adelaide paper. Bring in, as soon as possible, a Cat Tax.

We have a Dog Tax. Why not a Cat Tax? One shilling per annum from owners of tame domestic cats—*i.e.*, from nearly every house in the Commonwealth, would yield hundreds of thousands of pounds a year, sufficient funds to combat and keep in check the wild cat nuisance in the country. Encourage Hunt Clubs (for cats), in which the Fox Terrier would play a prominent part.

Place the Domestic Cat Gone Wild on the Vermin Schedules, with rewards for skins, as is done with the fox and dingo. Moreover, cat-skins, if in good order, are of commercial value. When I was in Western Australia, I ascertained that in one locality cats were so numerous that a settler who required a rug shot only those animals which were black.

To conclude, fellow members, *if we are in earnest about the proper protection of our native birds—some of them the wonders of the world—we should face the wild cat pest now, ere it be too late, and before unique species, like the Night-Parrot, Scrub-Bird, and other ground-loving birds, have passed out forever.*

P.S.—The only opposition to the proposed Cat Scheme may come from a certain section of farmers, who state that cats kill numbers of rabbits, which they (farmers) consider a greater evil. That argument is not logical, for so do foxes kill rabbits.

Mention was made that cat-skins were of commercial value, that is, for export; there is no local trade yet. I understand that in America the skins are largely used for coat-linings, etc.

The Cassowary in Captivity.—Although Cassowaries are rather shy and elusive birds in the wild state, when in captivity they become aggressive, and one has to be careful not to get within reach of their sharp claws, for some individuals will attack with great determination. Mr. H. W. Champion, of the Government Secretary's Department, Papua, has forwarded the evidence in connection with a case, in which a large Cassowary, that had been reared in captivity, caused the death of two natives. The native report states: "That when the Cassowary was a little big, it went bush, but it often came back to fight the village people." So well was this trait known that orders were given for no one to go about alone. However, a man named Tauno went out to his garden, and as he did not return, his mother went to look for him, and found him dead, with a very big Cassowary near by. No sooner did the woman put in an appearance than she was attacked, and so badly injured that she died. Careful inquiry by a magistrate left no doubt that the two people had been killed by the bird.

Notes on Extinct or Rare Australian Birds, with Suggestions as to Some of the Causes of their Disappearance.

By EDWIN ASHBY, M.B.O.U., C.F.A.O.U., Etc., "Wittunga,"
Blackwood, S.A.

Part I.

In the first class to be considered are those species that were confined to islands or very limited localities; the Kangaroo Island Emu and the King Island Emu are good examples of flightless, insular forms, which have become extinct.

In the case of the former, the recurrence of bush fires probably had most to do with its extinction. From earliest times it has been the custom of settlers to start huge bush fires, which swept the island from one side to the other. The object of these fires was to increase the feed for cattle and sheep. In King Island, with its more limited area, the Emu was most likely done to death through the direct agency of man.

Under this heading must also come the Phillip Island Parrot (*Nestor productus*). Phillip Island, it may be contended, is not strictly Australian, but it is stated that this parrot was also met with in the eastern part of New South Wales in limited numbers. The bird was extremely tame, and could be easily caught. It does not appear to have made much use of its wings, but inhabited the rocks and the loftiest trees, feeding largely on the honey contained in the flowers of a species of Hibiscus. The extinction of this bird in Phillip Island was entirely due to the convicts, who were confined to the island, killing the whole of the birds for food during a time of scarcity due to the usual supplies not coming to hand, through some mischance. Pressed by hunger, the convicts were easily able to kill these tame and almost helpless birds.

The causes which led to the extinction of the White Gallinule (*Porphyrio albus*) from Lord Howe Island are more obscure. It is not impossible that it was one of Nature's misfits, and was doomed to an early disappearance.

In the second class to be considered are those birds that may be menaced with extinction, if no special form of protection is provided; I allude to those species that nest in rookeries.

While Nature has seen to it that the fecundity of bird-life should be sufficient to meet the wastage due to predaceous animals, she seems to have produced a source of weakness in the habit developed in certain species of nesting in large rookeries.

We are aware of the almost total extinction of the Plumed Egret of Egypt, and kindred forms in other countries, and we know how the birds bred up again when complete protection

was afforded during the nesting season, that is, during the period during which the birds were found massed in rookeries.

The third class of Australian birds, which covers over 90 per cent. of our avifauna, seems to be unaffected by any form of protection at present instituted. Our "Bird Protection Acts," as factors making for the survival of Native Bird Life, are practically useless with the exception of the limited number of birds contained in the first two classes and the provision of "Bird Sanctuaries." The real causes that have made for the apparent extinction or increasing rarity of the species referred to in the following notes are somewhat obscure.

The Night Parrot (*Geopsittacus occidentalis*). Gould.—My heartiest thanks are due to Mr. J. Sutton, R.A.O.U., for having gathered together the extracts quoted below, referring to this interesting bird.

The late Mr. A. Zietz placed it on record that no skins of this species were sent into the S.A. Museum during his régime, i.e., since 1885. Mr. G. A. Kearland records in the *Horn Expedition*, Pt. I., p. 107, May, 1894: "Owing to the nocturnal habits of these birds, I was unable to obtain specimens, but the remains of those recently killed by dingoes were frequently found. During the summer of 1892, many were brought in by cats at Alice Springs Telegraph Station, and whilst there I was shown, by Mr. Field, portions of skins, wings and tails of the victims. Whilst the adult birds had borne a strong resemblance in colour and markings to the Ground Parrots (*Pezoporus wallicus*), it was evident from some which had been killed during moulting, that the young are not so bright in colour, because the bright green of the adults was replaced by brown in the young. . . As they frequent the dense 'Porcupine Grass,' in which they hide during the day, a good dog is necessary to find them. They are locally known as the 'Porcupine Parrot.' In one of the operators' rooms several picture frames were covered with wings and tails of the 'Porcupine Parrot,' which had been caught by a cat last summer."

Baron Von Muller, towards the end of 1867, transmitted to the Zoological Society, London, a live specimen of this parrot described by the donor as coming from the Gawler Ranges, in South Australia, and Mr. Sutton has since ascertained that the bird was sent to the Baron by the father of Sir Charles Ryan, R.A.O.U., on whose station it had been found. During the short life of this bird in the London Zoo, its habits were carefully watched, and recorded as follows:—"It is chiefly a nocturnal bird, shows a preference for green food, and its voice is a double note, harsh and loud."

The late F. W. Andrews, in a paper read before the Royal Society, South Australia, 2nd February, 1883, gives the following information about this species:—"The Night Parrot is found in the northern and north-western portions of this colony, and

specimens have been procured from Western Australia. During the day this bird lies concealed in the inside of a tussock or bunch of porcupine grass (*Triodia*), the inside being pulled out, and a snug retreat formed for its protection. Here also its rough nest is formed, and four white eggs laid. When the dark shades of evening have fairly set in, it comes out to feed, but generally flies to the nearest water, which is often at a considerable distance from its nest. In some instances I have known them to fly a distance of four or five miles. After drinking and shaking themselves up a little, they fly off to feed on the seeds of the porcupine grass, returning to the water two or three times during the night."

One asks, where is the Night Parrot now? Is it extinct, or where can it be found?

Since Mr. Andrews' day there have been a few spasmodic or flying visits to portions of the vast territory once occupied by these birds, but in face of the evidence adduced herein, we cannot wonder that this interesting bird was missed. At the time of the Horn Expedition, it was apparently numerous at Alice Springs, but such a keen observer as Kearland failed to secure a skin; the cause of this failure he ascribes to the nocturnal habits of these parrots. The success that attended the efforts of the late Mr. Andrews was certainly due to the fact that he camped in the neighbourhood of the birds' feeding grounds for many months, and was able to observe them at the waterholes. I have given the within data somewhat fully, in the hope that some who have opportunities denied to myself will be able, by closely following up these notes, to locate once again this interesting bird in its native haunts. I venture to think that it still lives in those wide tracts so little visited, stretching from Spencer's Gulf to well over the Western Australian border.

It should be searched for where Porcupine Grass flourishes and has been unswept by fires, keeping in mind the following advice, also culled from the notes of Andrews:—"They (the Night Parrots) come and go according to the nature of the season. When the early season is wet, the porcupine grass flourishes and bears large quantities of seed, on which the birds feed; but if, on the contrary, the season is a dry one, the grass does not seed, and no birds are to be seen."

There is not the slightest reason to suppose that Dingoes are more numerous than they used to be, and we must remember that, sheltered during the day by the encircling spines of the porcupine grass, the bird is probably immune from the raids of cats, except during its wandering abroad during the night.

The Ground Parrot (*Pezoporus wallicus*).—In this State (S.A.), except in the extreme south-east, where Dr. Morgan recently saw it, this bird has been considered extinct for many years. At the time of the first settlement of the colony, these Parrots nested in the extensive swamps that then formed the

delta of the River Torrens between Adelaide and the Gulf; but with the drainage and settlement of that district the birds have long disappeared. The following note by Mr. Andrews, dated 2nd October, 1883, seems well worth quoting. "Another curious and interesting songster to be heard on a warm evening about swampy country, such as the Square Water-hole (Mt. Compass), is the Ground Parrot (*P. formosus*), I say is to be heard, but I may almost say was, for the domesticated cats, that have become wild, and are now very numerous, have, as it appears, nearly exterminated them in their old retreats. The song of the Parrot consists of a perfect octave, given out in very beautiful sweet notes. I was a long time before I could find out what bird it was, and had to shoot one singing in the twilight to be sure of its identity."

Messrs. Parsons, McGilp and myself have made several expeditions to that locality in search of this bird, and still think it will be found there; its reduction in numbers is, in my opinion, more due to the burning at the end of Summer of the brush and tussocks of that region than to the ravages of cats. Still, I must admit that the peculiar habits of this species make it an easier prey to predaceous animals than is the case with the preceding species.

Three other Parrots have often been referred to as being extinct, or nearing extinction, but the writer has for years maintained that this view was probably incorrect, and that they would turn up, and recent events have demonstrated the correctness of this surmise.

Beautiful Paradise Parrot (*Psephotus pulcherrimus*). Gould.—Prior to 1902 this bird was not uncommon in the country inland from Rockhampton, in Queensland, and in January of 1915 Mr. Charles Barnard wrote, in reference to this species:—"We have not seen a bird since the 1902 drought, and from what I can learn, they are very scarce on 'Fairfield,' where we first took their eggs." It possibly removed to some new locality, driven out of its old haunts by the long drought. Chisholm (*Emu*, July, 1922) recorded the discovery of a pair of birds in December, 1921, by C. H. Jerrard, in the Burnett District, Queensland.

Turquoise or Red-shouldered Grass-Parrot (*Neophema pulchella*). Shaw.—The Editor of *The Emu*, in the issue of January, 1913, asks the question, "Does this beautiful ground-loving bird still exist in the flesh?" In the January number of the same magazine, 1915, A. J. Campbell, under the heading "Missing Birds," says, in reference to this species, "Many years ago I used to notice the Chestnut-shouldered Grass-Parrot on the flats about the Dandenong Range, about 20 miles eastward of Melbourne. The bird frequents the thick, scrubby, alluvial between Melbourne and Gippsland, and also those in the immediate neighbourhood of Sydney, and, as far as I am aware, there are no records of its occurrence until A. S. Le Souef's

record dated 8th September, 1920, in which he says, "I am glad to be able to report the appearance of a small flock of Chestnut-shouldered Grass-Parrots in the Camden district, near Sydney," and within the last few months the leader of the British Museum Expedition, Mr. Wilkins, records having collected this bird in western New South Wales.

Scarlet-chested Grass-Parrot (*Neophema splendida*). Gould.—Although this species, as well as the two preceding, have by many for a long time been considered to be almost extinct, J. N. McGilp records it as existing in small companies on his sheep station in the interior, and F. E. Parsons has made a skin of the specimen he brought down for identification.

To assume that all the little companies of this charming Parrot are assembled on this particular sheep station would be an unjustified assumption, as there are many similar stations in the interior. We may conclude that these little Parrots are possibly scattered in favourable situations throughout some of them; the apparent extreme rarity of the birds may possibly be due to the rarity of competent observers of Mr. McGilp's calibre, in the interior country.

Orange-breasted Grass-Parrot (*Neophema chrysogaster*). Latham.—My heartiest thanks are due to Dr. A. M. Morgan for the notes on the 1918 irruption of this Parrot into the south-eastern portion of this State.

Gould, as quoted by North, stated that he "observed (this Parrot) sparingly dispersed in the neighbourhood of Hobart Town and New Norfolk (Tasmania), but found it in far greater abundance on the Actaeon Islands, at the entrance to D'Entrecasteaux Channel. . . . On visiting South Australia in Winter, I then found it equally abundant on the flat, marshy ground bordering the coast, especially between Port Adelaide and Holdfast Bay (Glenelg)."

Ten months after the writer's arrival in Australia, in November, 1885, he found these charming little birds feeding on the flats behind the sand-hills at the Grange, near Adelaide, evidently the same spot where Gould had found them so numerous many years earlier.

I should estimate that there must have been several thousand in that district at that time; small boys from the Port were shooting them as they roosted in the native pine trees, which at that time formed a wood a mile or so in length. I collected two specimens—one skin is in the S.A. Museum, and the other in the Tring Museum.

From November, 1885, till the 9th October, 1918, when Dr. Morgan observed them in the south-east of this State, this bird seems to have disappeared from the regions visited by ornithologists. This, in spite of the fact that several earnest students of bird-life in this State had taken lengthy journeys, and visited many likely localities in search of them. The most

careful enquiries gave no clue as to their whereabouts. Then comes the irruption of 1918, particulars of which are given in the following notes supplied to me by Dr. Morgan for the purposes of this paper.

"I first saw *Neophema chrysogaster* on 9th October, 1918, at Beachport. There was a flock of about 20 or 30, which kept about the township. In addition, there were numerous small flocks in the sand-hills, to the north of the town, up to almost 4 miles out, which was as far as I went in that direction. Again at Robe a week later there were several flocks of from 20 to 30 in the scrub at the edge of the cliff and in the open ground near the gaol, also many smaller flocks in the sand-hills of Guichen Bay, up to about 4 miles north-east of the town, which was as far as I went. I saw in all several hundreds of the birds, and assuming that they were equally distributed between Beachport and Robe, there must have been many thousands. They were seen daily for a fortnight. The specimen I shot for identification was one of a flock of about 30 sitting on a wire fence of a back yard in the township of Beachport on 10th October, 1918. They were quite tame, and any number of specimens could have been secured. They were in flocks of 10 to 30, where the country was at all open, but in the scrub the flocks were smaller, and many in pairs. While passing through Beachport last January (1923), a *Neophema* got up from the rushes, near a swamp, behind the hotel, and made off; it may have been this bird, but I did not get a near enough view to be sure. Also near Kingston, at the end of the same month, three *Neophemas* flew over the car, but too fast to be identified."

About three weeks after Dr. Morgan's return from his 1918 trip, Capt. S. A. White made a special trip to the same locality in search of these *Neophemas*, but found none; they had entirely disappeared.

Part II. to follow; April, 1924.

Relationships of Tasmanian Birds.

By ROBERT HALL, C.M.B.O.U., Sometime President
R.A.O.U., Hobart.

Our knowledge of field relationships is so scanty that I propose to take one section of country, and make some comments. The Congress now being held in Southern Tasmania suggests that it be the Derwent Estuary, a drowned valley, about equally dividing the southernmost quarter of Tasmania. It lends itself to a fine survey of ocean and inland birds, with day and night flying sections.

The Derwent opens out from a magnificent range of water and great hills into an endless ocean at a point where myriads of non-flying birds and millions of specialised flying birds pass. Many come right into the estuary, the Penguins and Petrels

in particular. In fine weather, the former play about the ferry steamers of Hobart, the capital city; in foul weather, the latter.

Looking across this fusion of waters, each half-year we are astounded by the happenings, and yet we do not understand. There appears to be a shifting of seasonal quarters; circumpolar and local. Take, for example, the Albatrosses. The Snowy Albatross (*Diomedea chionopectera*), of Kerguelen waters in the Southern Ocean, shifts in winter to Tasmanian waters, another quadrant of the same ocean; the second-year young travelling with the adults. The Wandering Albatross (*D. exulans*) meets the Snowy west of Tasmania, and appears then to have left its own quadrant and gone westerly. The birds are mostly second-year Wanderers. We are further confused by the Royal Albatross (*D. epomophora*) being here on its western range in the winter season. Are we to understand the larger Albatrosses are ocean nomads in the winter season? *D. cauta*, the White-capped Albatross, nesting in Tasmania, seems to disappear in winter, and we get from the west an influx of the Grey-headed Albatross (*D. chrysostoma*). Where does our own Albatross go? Perhaps we have not got one that is exclusively our own! The Sooty Albatross (*Phoebastria fusca*), with the pale line along its bill, comes to us in the Winter, and the Tasmanian-New Zealand light-mantled species (*P. palpebrata*) disappears. This may be a great east to west annual migration. Mr. Iredale* speaks of the Snowy Albatross being northerly near Ceylon, and this is my experience also, and we have as well the Wandering Albatross noted by Dr. Wood in the Pacific Ocean up to 20° S. This appeals to me as occasional, subject to wind and temperature. If it proves to be a north-south migration, we shall have a strange phase of migration introduced to us.

The movements of Albatrosses may not be directly a matter of food supply, and we need a knowledge of inter-relationship with other animals. It may be that the food itself migrates, and the birds follow across thousands of miles of ocean. If the normal eastern-western course of the food supply is changed to the north, the birds then follow. A re-direction of the food supply may give us a double course of the birds in the one season.

Every year an odd migrating Arctic Skua Gull (*Stercorarius parasiticus*) comes from the northern hemisphere to close contact with Hobart. In a good year there are three or four in the estuary. Relationships of non-migrating species are variable racially, and such species have far more races than any other species. Nomadic birds are scarcely affected, and migrators not at all. If a long cycle of a changed climate occurs in Tasmania, there follows a delicate change throughout the

*"Emu," XXIII., pt. 2, pp. 96, 151, 1923.

plumage colour in all these birds. It is a uniform one, not generally noticeable, and is not seen at all in the nomadic section.

We are faced at the moment with a question of relationship of bird and fish, mainland and island. Of late years a commonwealth cormorant—the Black Cormorant (*Phalacrocorax carbo*)—has flown across in great numbers to those of our rivers which have been freshly stocked with European fish. The fish-eaters make a noticeable interrelationship of States, lasting only a few months of the year, and not every year. It may be the poverty of food in a bad season on the mainland that drives them across the straits, or it may be the abundance of food that increases the population, and this State gets the excess in the winter season. It is generally believed, by those who should know, that this family of birds in wealthy irrigation areas is a factor contributing to the salvation of economic Australia. This immigration and emigration is distinct from that of solitary birds of several species. It is quite apparent that odd birds of many species come to the straits islands of Tasmania without comment; and go without notice.

The matter of food supply concerns more than ocean and fish-eating birds just now, because on the well-known fishing banks of the Derwent Estuary the regular fish are absent. This will affect the doings of sea-birds and the interrelationship with other things.

Hobart, as an observation centre of the Derwent Estuary, has two land masses, east and west; a wet and a dry. At right angles, or practically north and south, there are two water areas, a fresh and a salt: the first in Summer being mostly brackish. Four sections of birds and an equal number of plants are evident, with varying zones of forest in the uplands. These latter are of interest as the birds range up and down. The west, up to 4000ft., supplies a moist air that encourages certain species, cousins to those on the moist hillsides across the strait. These four areas are permeated with marine remains of the early permian period, when Tasmania was connected with the mainland. Isolation has since occurred in late cretaceous* times, when a strait was formed, remaining as at present. The permo-carboniferous country (the four areas) is penetrated with large sills of diabase,** giving us two characteristics in both the east and west of Hobart (Mount Wellington (B) and Rumney (A)—Map I.). At the foot of the Rumney Range we have the clay sandstone sifted to give a sand bedding over clay, with certain plants for certain birds. The Rumney Range is sandstone at the railway, while further up it suddenly changes to diabase, with better food for definite

*Geology of Tasmania (R. M. Johnston). See map of early cretaceous.

**Outlines of Geology of Tasmania, Upper Mesozoic. (W. H. Twelvetrees).

birds. This is clearly seen on the path from Red Gate to the summit. The diabase belongs to the Upper Mesozoic, while the Lower Mesozoic flanking the eastern base of Mt. Wellington supports amphibian ancestors of our birds. Fossils of the pre-avian period are found 2000ft. up Mt. Wellington. Speaking broadly, we have now the modern birds of eucalypts. What they were when such vegetation as the elm, oak and laurel helped to cover the hill slopes in the early tertiary period, and when *Auracarias* divided the present junction of the Upper and Lower Derwent (Map I.) we cannot say. That was the day of the ancient lake of the Derwent. That age separated the present flourishing country of gum trees and parrots from the time of oak-like forests and odd-tailed birds—the fauna of a million years ago.

The Emu has finally disappeared from Mt. Rumney, up which it came through Richmond from the east coast and midlands; one of the last odd links of an avian chain of wonderful interest.

The modern birds—Honey-eaters and Pardalotes, for example—mostly owe their origin to the eastern area marked in Maps XII., XIV. Others, again, *e.g.*, Fly-catchers, are derived from the northern portion of Map XIII. That apparently has been the trend of bird expansion to Hobart, around which we get some definite local effects. These are shown in A—D, which have characteristic birds:—

A.—Rumney Range (Tasmanian Ground Bird: *Cinclosoma punctatum dovii*).

B.—Mt. Wellington (Large-billed Ground Thrush): *Oreocinclu lunulata macrorhyncha*).

C.—Upper Derwent: Bridgewater (Inland Ducks: *Anatidæ*).

D.—Lower Derwent: South Arm (Oyster-catchers: *Hæmatopus*).

This is the day in which we interest ourselves in the many surveys of a district, so that we get the most interesting view of things.

If we note the birds feeding in A—D, we are led to see many local effects; the different shrubs; the soils of varying values. By roughly tabulating A—D, we get botanically:—

A.—Rumney Range: Black Wattle (*Acacia*), Sag tussocks (*Xerotes*), Cranberry, heath and eucalypts (including *Eucalyptus risdoni*) in great bands on western faces.

B.—Mt. Wellington: Native Hazel (*Pomaderris*), Musk tree (*Olearia*), Native Currant (*Coprosma*), Teatree (*Lep-tospermum*), Tree-fern (*Dicksonia*), and three zones of eucalypts.

C.—Upper Derwent (Bridgewater): Estuarine and river plants.

D.—Lower Derwent (South Arm): Marine weeds of sea beaches, and dune plants.

Tasmania's isolation has kept her specially rich in peculiar

plants, though she has not increased in food producers. Observe that most of the heads of the kangaroo grass (*Anthistiria*) carry no seed; as a probable consequence we have only one Finch or Weaver Bird. The best reason is that the eucalypts overshadow everything, and are poor suppliers of humus. Associated with them everywhere are the Honey-eaters. Having eaten out one tract of country, and owing to certain gums flowering every second year, the Honey-eaters abound in a district for a year at the same altitude, or they may rise up the mountain side as the different zones of trees flower.

The Rumney Range is conspicuous for its heat-resisting vegetation, and birds that have a preference for the drier country. The Native Cherry (*Exocarpus*) and Sheoak (*Casuarina*) have no visible leaves see-able at a distance. The Eucalypts put the edges of their leaves to the sun to save evaporation. The Sag tussock (*Xerotes*) and the Cranberry of the heaths have hard leaves, yielding little moisture. Yet they provide an abundance of nourishing foods for certain birds. *Eriostemon*, or wax flower, stores sweets for those who like them, and has leaves that yield no excess of moisture on the hottest day. They grow luxuriously on the dry western slopes where Risdon's blue-tinted gum struggles to exist. Many birds attracted in this way cross fertilise the plants of a part of a country they otherwise would not enter. The Native Cherry, with its succulent red fruits, attracts the Bronze-wing Pigeon (*Phaps chalcoptera*), which makes many a meal from a single tree, and nests within it. The Brush Bronze-wing Pigeon (*Phaps elegans*) feeds on the seeds of the Silver Wattle (*Acacia dealbata*) in September and October, and on those of *A. decurrens* in December and January.

Ground birds of two natures are attracted to hundreds of acres of Cranberries—the Honey-eaters by the crimson flowers with nectar in the well-advertised sweet pots, and later, Seed-eaters to gather juicy fruit.

It is a matter of food supply only that draws the birds to what would otherwise appear dry, unprofitable hillsides. A secondary consideration is that these hillsides with an eastern aspect are warm and comfortable, though short of water. The somewhat cruel process of earth tilting has made a local effect of great interest. So far man has scarcely yet come in to lessen the strain of the vegetation by making conservation dams. He probably will, and the difference eventually between the fauna of A and B will not be so marked.

Section A attracts particular birds:—^{a1} Eucalypts: Parrots; ^{a2} Native Cherry: Hill Crow Shrike (*Strepera arguta*); ^{a3} Sag tussock: Ground feeders; ^{a4} Bursaria: Honey and insect feeders; ^{a5} Cranberry: Quails and Honey-eaters; ^{a6} Acacias: Birds with strong grinding gizzards; ^{a7} Oaks (*Casuarina*), inviting sanctuary to the Tasmanian Yellow-tail Thornbill (*Geo-*

basileus chrysorrhous leachi). The Oaks are of interest in so far as they have more claim to the country than any other tree, being the most prominent surviving member of an ancient house in trees. Theirs was the day of the permo-carboniferous. Strangely enough, the surviving members cluster among the small groups of diabase rocks in the permo-carboniferous series of rocks.

Section B is very different from A, the rainfall varying to the extent of 30 per cent. Mt. Wellington gives birth in deep beds of fallen leaves to trees that eventually become a mass of mossy drapings. The Musk, or the Daisy Bush, care for the nest of the Robin with a pink breast (*Erythrodryas rodinogaster*), while smaller shrubs will hold nests of the great Scrub-tit (*Acanthornis magna*). The strong-billed Honey-eaters (*Melithreptus validirostris*) will feed on the flowering gums this month, and next month will be up the mountain side at 2000ft., feasting and fattening rapidly upon the flowers of another gum. The Blackwood (*Acacia*), so feebly represented in "A," is at home here.

Sections "C," "D" are naturally not like each other, while both are different from "A" and "B."

In "C" there is a fine association of Ducks and Crakes; fair signs of an inland feeding water. Along its banks many of the birds common to "A" and "B" are seen. Just above Bridgewater there is a good seat for observation operations. During the past year the Cormorants were in masses, and Grebes were particularly plentiful. The last pronounced dry season of the mainland (1919), and later lesser ones, have forced an exodus of feathered life from Australia into Tasmania.

Section "D" faces the ocean one hundred miles nearer now than in days of old. A great lake included and extended one hundred miles south of the present estuary. It silted up in early tertiary times. South Arm is an accessible spot interesting in its sand dunes and their Honeysuckles (*Banksia*). This is essentially a coast tree, and like the sheoak, comes of an ancient family. Sag tussocks, with their usual economy in water, harbour the Grass-bird (*Megalurus*).

Principally, it is the sea-birds that engage our attention here. Perhaps we may see Richardson's Skua (*Stercorarius parasiticus*) from the northern hemisphere, but mostly birds from the Southern Ocean (Albatrosses), or the shore-wading birds that nest in Siberia and winter here (September to April). On rare occasions, as many as 1000 Little Stints (*Pisobia ruficollis*) may be seen at one time. Here the Penguins and Petrels nest.

The following is a list of birds found in "A," "B," "C," "D," intending to serve as comparative data:—

"B." — Mount Wellington. — Large-billed Ground Thrush (*Oreocincla lunulata macrorhyncha*), Scrub Tit (*Acanthornis magna*) Pink-breasted Robin (*Erythrodryas rodinogaster*);

Yellow-eared Black Cockatoo (*Calyptorhynchus funereus xanthonotus*), Tasmanian Thornbill (*Acanthisa ewingi*), Forty-spotted Pardalote (*Pardalotus quadragintus*), Strong-billed Honeyeater (*Melithreptus validirostris*), Dusky Fantail (*Rhipidura diemenensis*), Beautiful Firetail or Fire-tailed Finch (*Zonæginthus bellus*), Spotted Pardalote (*Pardalotus punctatus*), Hill Bell-Magpie (*Strepera arguta*), Tasmanian Magpie (*Gymnorhina hypoleuca*), Green Rosella (*Platycercus caledonicus*), Grey Butcher-Bird (*Cracticus torquatus cinereus*).

"A."—Rumney Range.—Tasmanian Ground-bird (*Cinclosoma punctatum dovii*), Yellow Wattle-bird (*Anthochaera paradoxa*), Banded Plover (*Zonifer tricolor*), Striated Field-Wren (*Calamanthus fuliginosus*), Dusky Fantail, Beautiful Firetail, Spotted Pardalote, Allied Swamp-Harrier (*Circus approximans gouldi*), Little Falcon (*Falco longipennis*), Hill Bell-Magpie, Skylark (*Alauda arvensis*) introduced, Tasmanian Magpie, Green Rosella, and Grey Butcher-Bird.

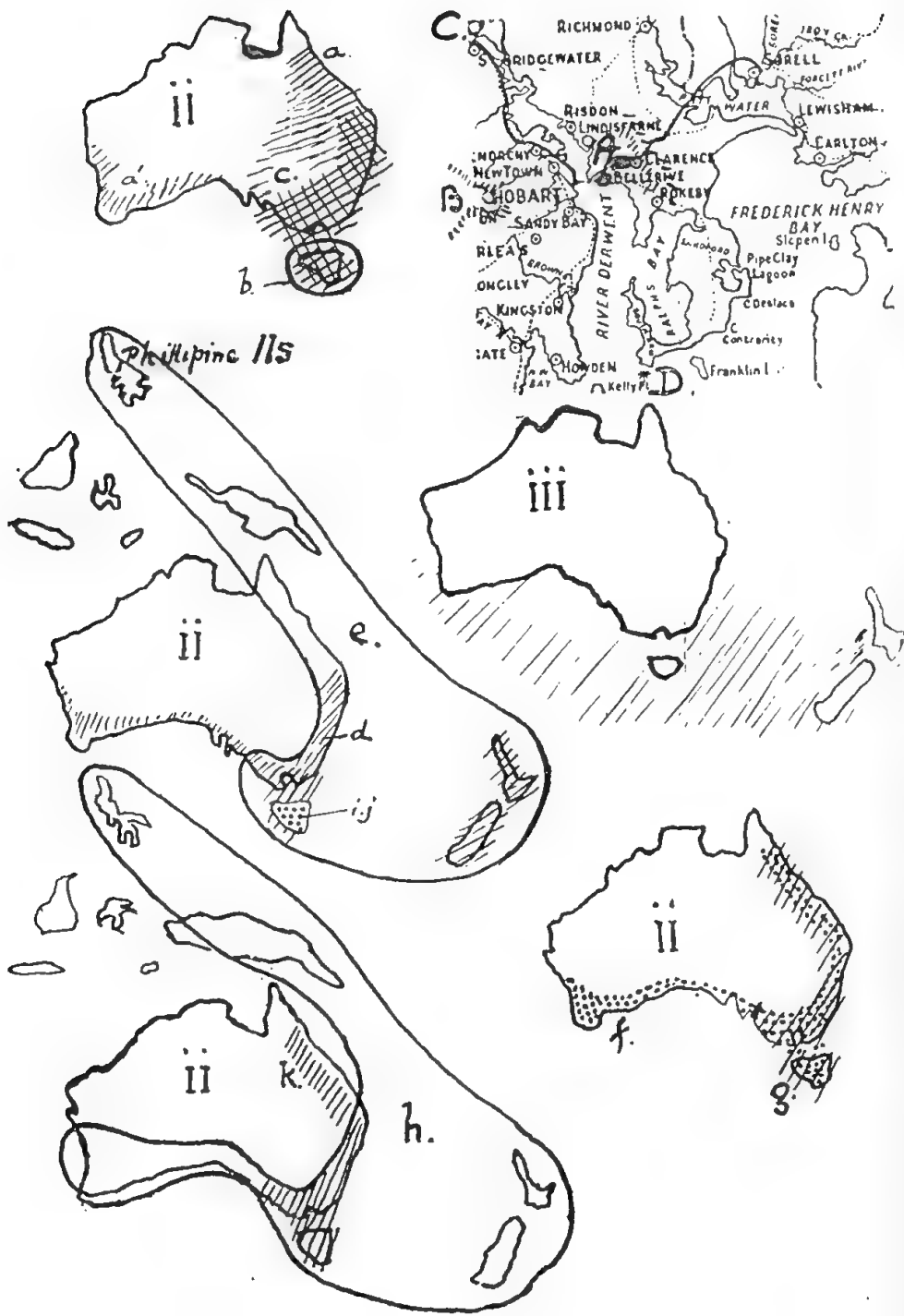
"C."—Upper Derwent.*—Black-breasted Plover and Striated Field-Wren, Freckled Duck (*Stictonetta naevosa*) and other Ducks, Native Hen (*Tribonyx mortieri*), Coot (*Fulica atra*), Tasmanian Bald Coot (*Porphyrio melanotus fletcheræ*), White-fronted Chat (*Epthianura albifrons*), Silver Gull (*Larus novaehollandiæ*), Spotted Pardalote, Cormorants (*Phalacrocorax*), White-faced Heron (*Notophox novaehollandiæ*), Allied Swamp-Harrier, Little Falcon, Skylark, Tasmanian Magpie, Green Rosella and Grey Butcher-Bird.

"D."—Lower Derwent.†—Yellow Wattle-bird, Black-breasted Plover and Striated Field-Wren, Pacific Gull (*Gabianus pacificus*), Oyster-catchers (*Hæmatopus*), Gannet (*Sula serrator*), Little Penguin (*Eudyptula minor*), Caspian Tern (*Sterna caspia*), White-fronted Chat, Silver Gull, Spotted Pardalote, White-bellied Sea-Eagle (*Haliæetus leucogaster*), Cormorants, Hooded Dotterel (*Charadrius cucullatus*), Reef Heron (*Demi-gretta sacra*), White-faced Heron, Allied Swamp-Harrier, Tasmanian Tawny-crowned Honeyeater (*Glyciphila melanops crassirostris*), Skylark, Tasmanian Magpie, Green Rosella, and Grey Butcher-Bird.

The following additional species are to be found in the wooded parts of all the areas "A"—"D":—Swift Parrot (*Lathamus discolor*), Tasmanian Rosella (*Platycercus eximius diemenensis*), Tree Martin (*Hylochelidon nigricans*), Welcome Swallow (*Hirundo neoxena*), Pipit (*Anthus australis*), Dusky Robin (*Amaurodryas vittata*), Scarlet-breasted Robin (*Petroica multicolor*), Flame-breasted Robin (*P. phoenicea*), Pallid Cuckoo (*Cuculus pallidus*), Fan-tailed Cuckoo (*Cacomantis flabelliformis*), Bronze-Cuckoo (*Chalcococcyx plagosus*), Black-faced Cuckoo-Shrike (*Graucalus novaehollandiæ*), Brown-rumped

*Referring mostly to fresh water birds.

†Referring mostly to salt water and shore birds.



See next page for explanation.

Thornbill (*Acanthisa diemenensis*), Blue Wren (*Malurus cyaneus*), Wood Swallow (*Artamus cyanopterus*), Whistling Shrike Thrush (*Colluricincla harmonica*), Silvereye (*Zosterops lateralis*), Yellow-tipped Pardalote (*Pardalotus striatus*), White-bearded Honeyeater (*Meliornis novæ-hollandiæ*), Brown Scrub-Wren (*Sericornis humilis*), Australian Raven (*Corvus coronoides*), Spotted Owl (*Ninox novæ-sealandiæ*), Tasmanian Yellow-tailed Thornbill (*Geobasileus chrysorrhous leachi*).

I have previously expressed the opinion that the birds of South-east Australia had their more recent origin in the Papuan sub-region. The series of maps here given appear to support the theory that the Derwent birds came this way, and not at all from the west of the continent.

DISTRIBUTION OF CERTAIN SPECIES FOUND IN AREAS

A—D.

Map I.—A, Rumney Range; B, Mt. Wellington; C, Upper Derwent; D, Lower Derwent.

II.—Quails and Rails—

- a. Stubble Quail (*Coturnix pectoralis*; C. p. *praetermissa*, sub-sp.); Stronghold.
- b. Tasmanian Brown Quail (*Synoicus ypsilophorus*).
- c. Eastern Painted Quail (*Turnix varia*).
- d. Slate-breasted Rail, or Water-Rail (*Rallus pectoralis*).
- e. Buff-banded Rail (*Hypotaenidia philippensis*); Stronghold: H. p. *mellori*, in Southern Australia.
- f. Little Crake (*Porzana pusilla*).
- g. Spotted Crake (*Porzana fluminea*).
- h. Spotless Crake (*P. plumbea*); Stronghold.
- i. Tasmanian Native Hen (*Tribonyx mortieri*).
- j. Tasmanian Bald Coot (*Porphyrio melanotus fletcheræ*).
- k. Coot (*Fulica atra*); Distribution of the Eastern Variety.

III.—Crested Penguin (*Eudyptes chrysocome*); Little Penguin (*Eudyptula minor*).

IV.—Plover-like Birds found in Area D.—

- a. Turnstone (*Arenaria interpres*); practically over the globe.
- b. Grey Plover (*Squatarola squatarola*), and Greenshank (*Glottis nebularius*); distributed over the whole world.
- c. Oyster-catchers (*Haematopus*); distributed along sea beaches.
- d. Black-breasted Plover (*Zonifer tricolor*), Banded Stilt (*Cladorhynchus leucocephalus*), Black-fronted Dotterel (*Charadrius melanops*).
- e. Sharp-tailed Stint (*Pisobia acuminata*).
- f. See Map III., p. 85, *Emu*, Vol. XIX., Curlew and Whimbrels; see Map IV., p. 85, *Emu*, Vol. XIX., Little Sand Piper; see May V., p. 85, *Emu*, Vol. XIX., Snipe.

V.—Hérons found on the Derwent (C, D).—

- a. White-necked Heron (*Notophox pacifica*).
- b. White-faced Heron (*N. novæ-hollandiæ*), Australian Bittern (*Botaurus poiciloptilus*), Nankeen Night Heron (*Nycticorax caledonicus*).
- c. Reef Heron (*Demigretta sacra*), White Egret (*Egretta alba*).

VI.—a. Black Cormorant (*Phalacrocorax carbo*).

- b. Little Black Cormorant (*P. ater*).
- c. Little Pied Cormorant (*Microcarbo melanoleucus*).
- d. White-breasted Cormorant (*P. fuscescens*).

VII.—Hawk-like Birds.—

- a. Black-cheeked Falcon (*Falco peregrinus*); Little Falcon (*F. longipennis*); Brown Hawk (*Ieracidea berigora*); Kestrel (*Cerchneis cenchroides*); Wedge-tailed Eagle (*Uroaetus audax*).
- b. White-breasted Sea Eagle (*Haliaetus leucogaster*), and Osprey (*Pandion haliaetus*); extending along W.A.
- c. Grey Goshawk (*Astur novæ-hollandiæ*).
- d. Swamp-Harrier (*Circus approximans*); Sparrow Hawk (*Accipiter cirrhocephalus*).

Parrot-like Birds, VIII.-XI.—

VIII.—Lorikeets—

- a. Little Lorikeet (*Glossopsitta pusilla*).
- b. Musk Lorikeet (*G. concinna*).
- c. Rainbow Lorikeet (*Trichoglossus moluccanus*).
- c¹: c, c¹, Distribution of the genus.

IX.—Cockatoos—

- e. Ganggang Cockatoo (*Callocephalon fimbriatum*).
- f. White Cockatoo (*Cacatua galerita*); Stronghold.
- h. (in X) Yellow-eared Black Cockatoo (*Calyptorhynchus funereus xanthonotus*).

X.—Broad Tails—

- g. The Green Parrot (*Platycercus caledonicus*).
- h. Rosella (*P. eximius*).
- H. Distribution of 75 per cent. of genus *Platycercus*.

XI.—Grass and Ground Parrots—

- i, j, k. Blue-winged Grass-Parrot (*Neophema chrysostoma*); Orange-breasted Grass Parrot (*N. chrysogaster*); The Ground Parrot (*Pezoporus wallicus*).
- k¹. The Ground Parrot of Tasmania (*P. w. leachi*).
- k². The extension of the genus *Pezoporus*, and of *Neophema*, apart from *Psephotus*.

XII.—Robins.—

- a. Dusky Robin (*Amaurodryas vittata*).
- b. Pink-breasted Robin (*Erythrodryas rodinogaster*).
- c. c¹, Scarlet-breasted Robin (*Petroica multicolor*); c², Flame breasted Robin (*P. phoenicea*).

The dotted lines indicate the area of the Western Scarlet-breasted Robin, a bird differing only in its smaller forehead patch of white. It was derived from c, c¹.

XIII.—Flycatchers.—

- a. Dusky Fantail (*Rhipidura flabellifera diemenensis*).
- b. Satin Flycatcher (*Myiagra cyanoleuca*).
- c. Leaden Flycatcher (*M. rubecula*).

XIV.—Pardalotes—

- a. Forty-spotted Pardalote (*Pardalotus quadragintus*).
- b. Yellow-tipped Pardalote (*P. striatus*).
- c. Spotted Pardalote (*P. punctatus*).

XV.—Honeyeaters—

- a. Yellow Wattle-bird (*Anthochaera paradoxa*); Yellow-throated H.E. (*Meliphaga flavigula*); Strong-billed H.E. (*Melithreptus validirostris*); Black-headed H.E. (*M. affinis*); Tas. Spinebill H.E. (*Acanthorhynchus tenuirostris dubius*).

- b. Tawny-crowned H.E. (*Glyciphila melanops*).
- c. Crescent H.E. (*Meliornis pyrrhoptera*); White-bearded H.E. (*Meliornis novæ-hollandiæ*); Brush Wattle-bird (*Anthochaera chrysoptera tasmanica*); Noisy Miner (*Myzantha garrula*).

Commenting upon the birds of the above list, and taken in the order of the Official Check List (R.A.O.U.), we find first the Quails and Rails, after the extinct Emu.

(To be continued, April, 1924.)

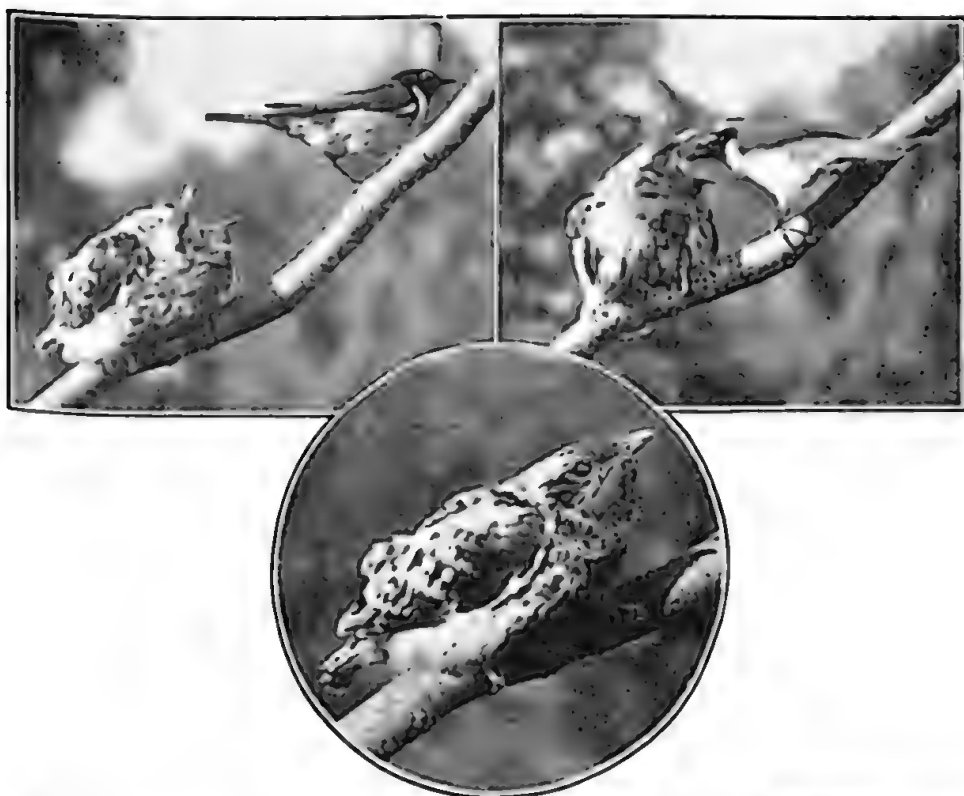
Notes on the Early Nesting and Range of Birds near Hobart.

By M. S. R. SHARLAND, R.A.O.U., Hobart.

Read at Annual Congress, Hobart, Nov., 1923.

Spring in Tasmania came early this year. The weather from July well into September was all that could be desired, so far as ornithological observation was concerned; warm, sunny days prevailed for weeks on end, and many birds, not as a rule early nesters, took the opportunity so afforded for commencing their breeding operations. Unfortunately, this period of fine weather did not extend very far into the season, for rain and falls of snow were interspersed with the sunny days, with the result that nesting in the latter part of September and during October was subjected to considerable interference. Some birds that laid their eggs in the fine weather left them in some cases for ten days or so before starting incubation. Birds are naturally limited in their numbers in the vicinity of Hobart, and although comparatively few species were found nesting in the early part of the season, many individuals of species were observed to be doing so. Perhaps the earliest of birds to nest is the Ground or Mountain Thrush (*Oreocincla lunulata*), with the exception of the Brush Bronze-wing Pigeon (*Phaps elegans*), which appears to disregard the nature of the season and nest throughout the year, and therefore is scarcely in the category of an early nesting species. The Mountain Thrush, however, can be seen engaged in its family cares while snow is on the ground, and when wintry conditions are by no means passed, and so warmly is the nest constructed and so closely does the bird usually sit that neither eggs nor young are affected by the cold. I found several nests this year. Most of them were in a particular gully on the slopes of Mount Wellington, close to Hobart, and near the edge of a clearing. Two were situated on the top of dead stumps well concealed by a thick growth of musk and ferns, two were in the centre of a thick bunch of Blue Gum (*Eucalyptus globulus*), without any solid support, except that afforded by the frail branches of the saplings, and others were on limbs of willow and wattle trees close to the edge of a creek.

The first nest of the season, belonging to the Mountain



*Upper, Left : Young Pallid Cuckoo calling to Black-headed Honeyeater.
 Right : Honeyeater feeding young Cuckoo. Centre : Young Cuckoo.
 Lower : Adult Little Penguin resting on full length of foot.*

Photos. by M. S. R. Sharland, R.S.O.U., Hobart.

Thrush, was found on August 6, being then just ready for the reception of eggs. A week later it contained its clutch of three. During the time occupied from the appearance of the eggs and the exit of the young, there were two heavy falls of snow, one of which lasted nearly 48 hours, but the birds were not affected by them. On August 9, another nest was discovered holding three eggs with the bird sitting, and three days later two more came under my notice, one of which contained two eggs and the other one. The Mountain Thrush is practically sedentary, because those birds under my observation for the past three or four years have, unless seriously disturbed, remained in a certain small area in the gully, and besides feeding there all the year, bred in precisely the same situation many seasons in succession. The bird appears to keep to the well-wooded hills on the western (Hobart) side of the River Derwent, and is rarely, if ever, seen round about the eastern suburbs.

It might be mentioned here that the River Derwent plays by no means an unimportant part in the distribution of birds in the vicinity of Hobart, inasmuch as it forms a natural barrier to a certain number of birds which are either found one side or the other. As I mentioned in the introduction to a paper on the Birds of Hobart (*vide Emu*, Vol. XXII., p. 127), there is a marked contrast in the type of country on either side of the river. Hilly and mountainous in the extreme is the western side where the slopes and gullies are thickly verdured and where conditions are such that many varieties of birds, the Mountain Thrush, for instance, find ample food to keep them there throughout the year, while on the eastern side, in the vicinity of Bellerive and Lindisfarne, and a few miles back, vegetation is lightly distributed, and it is safe to say a majority of the birds is found there.

Other birds observed engaged in nesting operations in the early part of the season were as follows:—

Tasmanian Thornbill (*Acanthiza ewingi*).—Aug. 6, ready for eggs.

Yellow-tailed Thornbill (*Geobasileus chrysorrhous*).—Aug. 13, two eggs.

Black-headed Honeyeater (*Melithreptus affinis*).—Aug. 13, building.

Noisy Miner (*Myzantha garrula*).—Aug. 19, one egg, and building.

Spotted Pardalote (*Pardalotus punctatus*).—Aug. 19 and 21, building, and 2 eggs.

Banded Plover (*Zonifer tricolor*).—Aug. 19, four eggs, well incubated.

White-fronted Chat (*Epthianura albifrons*).—Aug. 24, 3 eggs, and 3 big young.

Dusky Robin (*Amurodryas vittata*).—Sept. 1, half-fledged young.

Yellow-throated Honeyeater (*Meliphaga flavicollis*).—Sept. 3, 3 eggs, sitting.

Shrike Thrush (*Colluricincla harmonica*).—Sept. 5, 1 egg.

The period of fine weather broke about the middle of September, and wintry conditions prevailed for a couple of weeks, snow, rain and wind alternating and combining forces to make things as unpleasant as possible for bird photography and study. There was a noticeable interruption in nesting throughout the southern part of Tasmania.

The lightly timbered slopes of the hills on the eastern side of the river are the home of the Noisy Miner, which nests in abundance there from August to November, sometimes later, building its nest in comparatively low but frail branches of gums. The Miner is in great numbers round Bellerive and Lindisfarne, and, except in one or two favoured spots, such as the Queen's Domain and Botanical Gardens, is not often seen on the opposite side of the Derwent. The young of the Miner, and, in fact, of most of the smaller varieties of birds that nest in certain moist places in the vicinity of Bellerive, seem to be subject to the attack of a parasitic fly, the larva of which, resembling a large maggot, burrows beneath the bird's skin a few days after hatching, and apparently feeds upon its host. The parasite, a repulsive thing, sometimes attains a length of over half an inch, and is a quarter of an inch in girth. Before the young bird grows its first down it is sometimes covered with the maggot, which frequently is found in its ear and mouth, in which case the host is destroyed. When extracted with a pin, the parasite will often burst and scatter the blood it has evidently drawn from the nestling. So far, I have been unable to identify the fly.

On an upland slope of the foothills of Mount Runney, away to the back of Bellerive, I found two nests of the Banded Plover in the early part of the season. One contained four eggs well into the incubation period, and the other, two. In each case they were out in the middle of a field well away from vegetation. The Banded and Spur-winged Plovers are Tasmania's only two resident *Charadriidae*, and the former is in the minority, the Spur-wing being well distributed throughout the State. It is interesting to note that it is unusual to find the Spur-wing and the Banded Plovers together. Some years ago at Bellerive *Lobivula nova-hollandiae* was very plentiful, and *Zonifer tricolor*, with the exception of one or two "strays," was totally absent, but within the last three or four years matters have been reversed, and the Banded Plover reigns there. Furthermore, along the East coast, near Swansea and Bicheno, and in certain parts of the midlands, I am told, the Banded Plover, at one time in numbers, has given place entirely to the Spur-wing, which has increased noticeably. Possibly the Banded has come south, since its appearance here synchronises with its exit from places in the north.



Small-billed Cuckoo-Shrike about to feed young in nest.

Photo. by M. S. R. Sharland, R.A.O.U.

The White-fronted Chat (*Epthianura albifrons*) is especially common in the south. The moist, low-lying places on the eastern side of the Derwent, where there is favourable cover for nesting, seem to be its stronghold. It is gregarious, and moves about a lot, but never actually leaves the island. It is the only form of *Epthianura* we have in Tasmania.

Another indication of an early Spring was the arrival of migrants some days before their usual time. During the first week in August, the note of the Bronze Cuckoo (*Chalcites basalis*) was heard round Hobart, the following week came the Fantail (*Cacomantis flabelliformis*), and at the end of the month the Pallid (*Cuculus pallidus*), put in an appearance, its call being heard on both sides of the river. The Dusky Wood-Swallow (*Artamus cyanopterus*) and the Satin Flycatcher (*Myiagra cyanoleuca*) did not arrive till their usual times, the former in the middle of September, and the latter late in October, but the Welcome Swallow and Tree Martin appeared on August 31 and September 1, respectively. There is good evidence that some individual birds suffer their migratory impulses to lapse, since an odd pair of Swallows flying about the streets of Hobart on a warm day in Winter is no uncommon sight; and on the east coast, the Martin is known to remain all the Winter in numbers. A Fantail Cuckoo was seen on Mt. Nelson, close to Hobart, in the middle of winter two years ago.

Bird Observations Made by Delegates to the Tasmanian R.A.O.U. Camp-Out.

By J. N. MCGILP, Member of Council, R.A.O.U.; and F. E. PARSONS, President, S.A. Orn. Assn.

The annual camp-out of the R.A.O.U., at Adventure Bay, South Bruny Island, Tasmania, which was held immediately after the conclusion of the business of the 1923 Hobart Session, proved to be one of the most interesting and enjoyable that the Union has yet held. Our Tasmanian members are to be congratulated on the selection of such a charming and suitable locality, and the sincere thanks of the campers are due to Mr. Clive Lord, the local State Secretary of the Union, who was responsible for the very thorough preparations and arrangements that were made; for all agreed that the arrangements were perfect, and left nothing to be desired by even the most exacting of the party; the only regret that was expressed being that the camp was not attended by a more representative number of members from the various States. The party who participated in the camp-out, which lasted 6 days, was composed of 7 South Australians, 3 Tasmanians, and 3 Victorians; amongst the latter was the newly-elected Secretary of the Union, Mr. J. Cross. Close acquaintance with him at the camp assured us that he

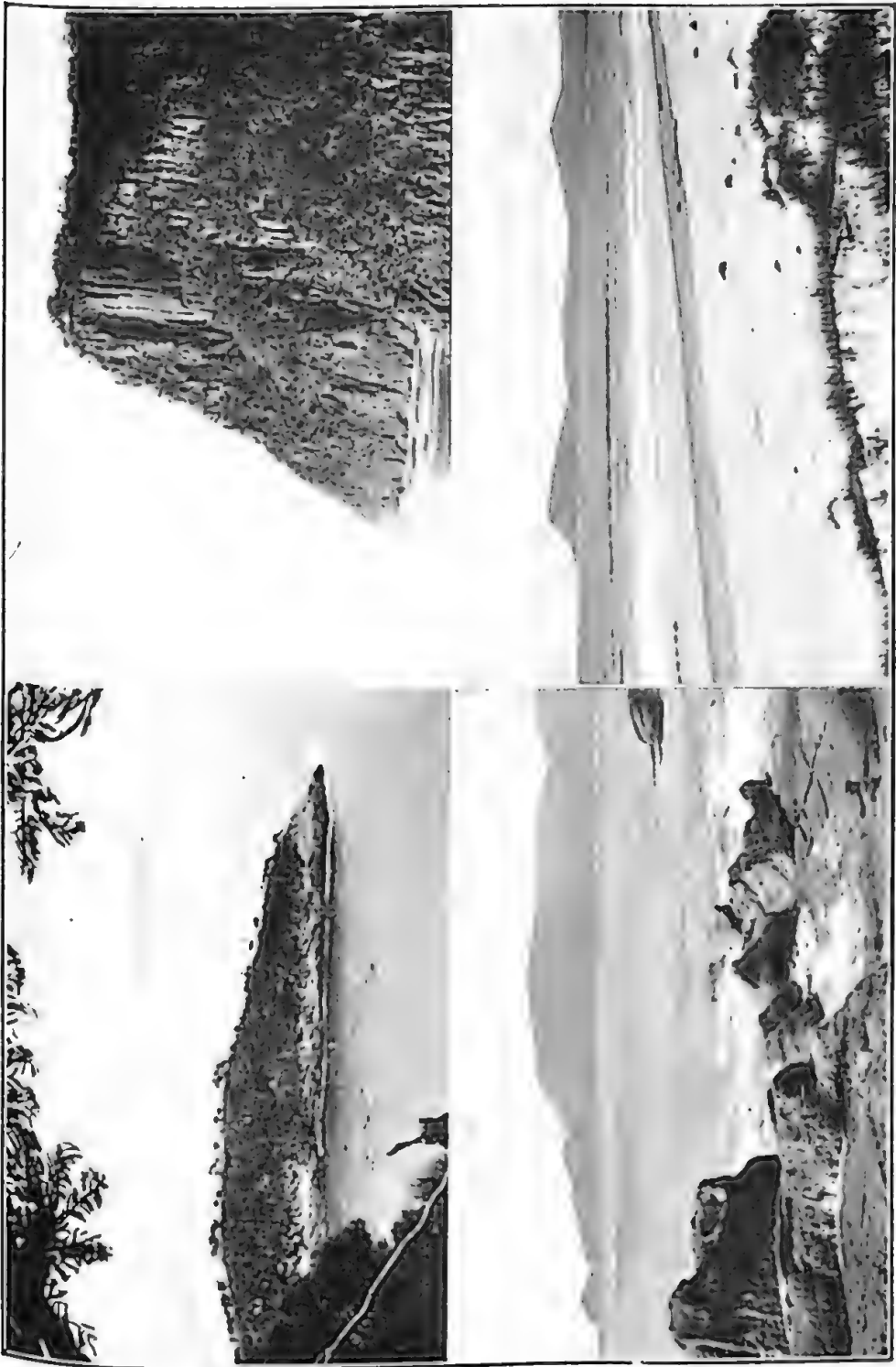
is the right man, and that the good work previously done by our late Secretary will be equally as well carried out by Mr. Cross.

The business of the Congress being completed by November 8th, the intending campers met on the wharf on the morning of the 9th, to embark for the site of the camp. The weather was anything but pleasant. Steady rain had set in, and, to the mainlanders, had every appearance of continuing for a lengthy period; but, thanks to our Tasmanian friends, we were advised to continue with our project. By the time we had finished the 30-mile trip in a small steamer to Alonnah, our port of disembarkation on Bruny Island, the weather had broken, and, save for a slight shower or two, which fell while we were being conveyed in horse conveyances of various types across the island to Adventure Bay, was the beginning of ideal weather for camping.

The quarters in which we were housed were almost too comfortable for a camp, and were prettily situated overlooking the Bay—the very Bay that figures so largely in the early history of Australia, for it was in this Bay that Tasman, in 1642, had his first glimpse of Tasmania, but was unable to land owing to rough seas. And here again, in March, 1773, Captain Furneaux, in the *Adventure*, anchored in the Bay, and named it after his ship. Again, Captain Cook called in at this Bay in 1777, and replenished his supply of water from one of the small creeks that empty into the Bay close to the site of our camp. Here he marked a large tree, which is always known locally as Cook's Tree, but, unfortunately, instead of being attended to and preserved, it has been cut into and burned, until now fragments only are left.

The type of country on the island varies very considerably, consequently we were enabled, within a comparatively small radius of the camp, to observe a very varied collection of species. On the coast there were the Sea Birds, which included Gannets and Penguins, then just back from the foreshore, where the country was fairly open with large gums, we met with Quail, Honeyeaters, Wattle-birds, Cuckoo-Shrikes, etc., and perhaps a mile inland, where the hills reached a height of 1000 to 1400 feet with damp tree-fern gullies, in which grew stately moss-covered Beech trees, we met with that little gem, the Pink Robin. So it can be seen that a situation which afforded the opportunity of observing birds requiring diversified types of country, was eminently suited for a Union Camp-Out.

With regard to the nesting of the birds, we appeared to be either too early or too late. Many nests of such birds as Thornbills, Flame Robin, Dusky Robin, and others being found all with young, while others of Scrub-Wrens (*Sericornis*), Field-Wrens (*Calamanthus*), Fire-tailed Finch (Beautiful Fire-tail), etc., were apparently just ready for eggs. The birds of the island are not without their enemies, as they are at the mercy of numerous snakes, and wild domestic cats. One



Upper Left: Penguin Island from Fluted' Cape.
Lower: Adventure Bay, with Fluted Cape and Penguin Island in the background.
Right: Fluted Cape; Cliff 1,000 feet high.

member of the party was fortunate in being able to destroy a very large wild cat that he met with while out in the thick scrub, thereby saving probably scores of our small birds.

The local inhabitants were entertained on two evenings during our stay by three of our members. Dr. Leach delivered a very interesting and instructive lecture on Australian Birds, forcibly advocating protection, and incidentally admonishing the residents of Adventure Bay to preserve such local historical landmarks as "Cook's Tree," and a kitchen midden, where the now extinct Tasmanian aborigines once congregated and did their cooking. Judging from the interest that was aroused, future visitors to Adventure Bay will doubtless see that these historic relics are properly guarded, and suitably inscribed. Mr. Clive Lord lectured, with the aid of a lantern, on the Scenic Beauties of Tasmania, and even some Tasmanians were surprised that their State held such beauty spots. Mr. Sharland, who is doing splendid work among the birds with the camera, showed some very fine slides from photographs he had taken, the amount of patience required being judged when he said that some photos necessitated coaxing the bird to within 2 feet of the camera. We are looking forward to seeing some very fine photographs reproduced in *The Emu* that are the result of the ability and patience of this energetic bird photographer.

Much regret was expressed when the day of our breaking camp arrived, as each day proved more interesting than the one before it. The day after our return to Hobart the mainland members of the party entertained the local friends, and took the opportunity of expressing their appreciation of the very lavish and hospitable manner in which they had been entertained during their all too short sojourn in the capital of the Island State. At Bruny Island the members between them noted 67 different species, but they by no means have exhausted the list that could be completed of birds that frequent the island, for some birds that we were given to understand were common we had not the opportunity of identifying. Over 100 species of birds were observed during the trip.

The following list of birds includes, besides those observed at the camp-out, a few sea birds that were observed during the voyage from Melbourne to Launceston, those identified on the trip to and from Launceston to Hobart, also those that were noted by Messrs. McGilp and Parsons at Scottsdale during a few days spent there before leaving for Melbourne.

Eudyptula minor. Little Penguin.—A rookery of the quaint Little Penguin was seen at the Neck, a long narrow isthmus between N. and S. Bruny Islands. The burrows contained from fresh eggs to young birds. The pair of parent birds were seen in the burrow in one instance, the nest containing one fresh egg. The young is a pretty creature, its coat of dusky down resembling fur. Date, 11.11.23. The burrows were from 3 to 4 feet in length, and were excavated into the sand dunes under tea-trees, and *Mesembry-*

anthemum (pigface). The nest was a bed of seaweed, cutting grass, and was lined scantily with grasses. The birds sat in the burrow till they were pulled out. Several dead Penguins were seen along the beach.

Synoicus australis. Brown Quail.—Several were noted on Penguin Island by Messrs. Lord, Reid and Parsons, who waded over the narrow channel separating Penguin Island from S. Bruny Island. Another observation of this bird was made close to Adventure Bay.

Synoicus ypsilophorus. Swamp-quail.—A single bird was seen from the railway carriage *en route* from National Park to Hobart, which Mr. A. Butler and Miss Fletcher thought was probably the Swamp-Quail.

Phaps elegans. Brush Bronzewing.—Two birds were noted in the National Park. A fair number were distributed along the flats near the coast at Adventure Bay.

Porzana fluminea. Spotted Crake.—Heard calling in a swamp at Adventure Bay, also at Scottsdale, in several swampy localities.

Porzana pusilla. Little Crake.—Mr. Parsons identified this bird by its call from a cutting-grass swamp near Scottsdale.

Tribonyx mortieri. Tasmanian Nativehen.—Just out of Launceston this bird was first met with, and was to be seen in fair numbers in suitable localities along the railway line to Hobart. Mr. McGilp saw a single bird in a dense swamp near Adventure Bay. Tasmanian bird observers claim that this bird is not able to fly.

Porphyrio melanotus. Eastern Swamphen (Bald Coot).—A few birds were noted on Lake Tiberius, also near New Norfolk; they were not nearly so plentiful as the preceding species.

Fulica atra. Coot.—Many were seen on the Derwent River, near Bridgetown.

Podiceps sp. Grebe (Dabchick).—A single bird was reported by Dr. Leach at Bridgetown, on River Derwent; he thought it the Black-throated (*P. ruficollis*), but observation was too short to identify it with certainty.

Puffinus tenuirostris. Mutton-bird.—The skeletons of many Mutton-birds, or Short-tailed Petrels, as well as those of the Little Penguin, were found beside a log near the beach on Bruny Island, opposite Penguin Island; probably this was a feeding place of the White-breasted Sea-eagle observed close by.

Hydroprogne caspia. Caspian Tern.—Mr. R. Reid reported having seen this fine Tern on his passage by boat from Hobart to Bruny Island.

Sterna bergi. Crested Tern.—A fairly common bird, from Port Phillip to Launceston.

Sterna nereis. White-faced Tern.—Two birds were seen in Port Phillip Bay.

Larus novæ-hollandiæ. Silver Gull.—Commonly seen from Melbourne to Launceston, at Hobart and Adventure Bay; many birds in immature plumage, probably last season's young, were seen.

Gabianus pacificus. Pacific Gull.—Seen in similar localities to preceding species. Many immature birds were observed, one of which was noted to lift from the sea a large piece (probably a quarter of a loaf) of bread cast out from the steamer "Nairana." The splendid soaring of these fine birds was much commented on by members of the party.

Stercorarius parasiticus. Arctic Skua.—Birds showing the two colour phases of this interesting northern species were seen in fair numbers from Melbourne to entrance of the River Tamar. Many flew close round the steamer after meal-time.

Hæmatopus ostralegus. Pied Oyster-catcher.—A pair of these beautiful birds was seen on the sandy beach at the mouth of Cook's River, Adventure Bay.

Hæmatopus unicolor. Black Oyster-catcher.—A single bird was seen on the rocky coast, just north of Adventure Bay.

Lobibyx novæ-hollandiæ. Spur-winged Plover.—A common bird in cleared land throughout the train journey from Launceston to Hobart, seen occasionally at Adventure Bay. It is remarkable that, though the Banded Plover (*Zonifer tricolor*) is considered common in Tasmania, this species was not observed by us, and young birds just able to fly were noted in a crop near Scottsdale.

Charadrius ruficapillus. Red-capped Dotterel.—A single bird was observed by Mr. Clive Lord at The Neck, the long narrow strip of drifted sand that joins North and South Bruny Islands.

Charadrius cucullatus. Hooded Dotterel.—Seen by Messrs. Lord and Reid on N. Bruny Island.

Numenius cyanopus. Eastern Curlew.—Noted by Messrs. Lord and Reid, near Cape Frederick Henry, on N. Bruny Island.

Pisobia ruficollis. Red-necked (Eastern Little) Stint.—Noted in large numbers on dredged banks, at the mouth of River Yarra, near Melbourne.

Notophoxys novæ-hollandiæ. White-faced Heron.—Observed several times during the train journey from Launceston to Hobart; one bird was seen at Adventure Bay, and two at Scottsdale.

Chenopsis atrata. Black Swan.—Seen on River Tamar, also noted on N. Bruny Island by Messrs. Lord and Reid.

Anas superciliosa. Grey Duck.—The commonly-called Black Duck was noticed in creeks near Lake Tiberius, and on the River Derwent. Few Ducks were observed throughout the trip.

Virago gibberifrons. Grey Teal.—Seen in small numbers on the River Derwent.

Nyroca australis. Australian White-eyed Duck.—Observed on a creek and in flight near Lake Tiberius.

Biziura lobata. Musk Duck.—Observed by Dr. Leach close to the edge of Lake Tiberius.

Phalacrocorax carbo. Black Cormorant.—A common bird on the Rivers Tamar and Derwent, and along coast lines; seen at Adventure Bay.

Phalacrocorax ater. Little Black Cormorant.—Seen in similar localities to *P. carbo*.

Phalacrocorax fuscescens. White-breasted Cormorant.—Seen along coast line, in larger rivers and in Adventure Bay.

Microcarbo melanoleucus. Little Pied Cormorant.—Seen in fair numbers on swamps and lakes in the Midlands.

Sula serrator. Australian Gannet.—Noticed shortly after leaving Melbourne, and throughout the sea trip to mouth of River Tamar; also observed at Adventure Bay. A fine exhibition of diving was given by a party of these birds close to Penguin Island.

Pelecanus conspicillatus. Australian Pelican.—Several noted shortly after leaving Melbourne, and one bird was seen on the River Tamar.

Circus approximans. Swamp-Harrier.—Noted over swamps, etc., throughout our travel in Tasmania; also observed at Adventure Bay. The scarcity of other Hawk-like Birds was noticeable.

Astur fasciatus. Australian Goshawk.—A beautifully plumaged female was closely observed as it rested in a Stringy Bark tree at Scottsdale.

Haliaetus leucogaster. White-breasted Sea-Eagle.—This fine bird was noted flying over the sea near Fluted Cape, S. Bruny Island. A large nest high up in a giant Eucalypt near Adventure Bay was probably the nest of this species.

Falco peregrinus. Peregrine Falcon.—On our return journey from the National Park, near New Norfolk, Mr. A. Butler was informing us that a Black-cheeked Falcon used to nest in some cliffs on

the hillside, when this species was observed, as if in confirmation of Mr. Butler's statement; the only record for the trip.

Ieracidea berigora. Brown Hawk.—Fairly common on open country; only the dark form was noted. Its peculiar call was often heard over forests at S. Bruny Island and Adventure Bay.

Cerchneis cenchroides. Nankeen Kestrel.—A pair was seen sitting on a telegraph post, near Epping Forest.

Ninox novæ-zealandiæ. Spotted Owl.—Seen at Adventure Bay. One called close to the camp at night.

Calyptrorhynchus funereus. Yellow-tailed Black Cockatoo. A fine pair was seen to fly from a large Honeysuckle (*Banksia*), in Epping Forest.

Cacatua galerita. White Cockatoo.—Dr. Leach reported having seen a party of a dozen birds of this species when motoring from Launceston to Hobart.

Platycercus eximius. White-cheeked Rosella.—Mr. Edwin Ashby reported having seen this parrot between Ross and Bridgetown.

Platycercus caledonicus. Green Rosella.—These fine birds were noticed in the National Park, at Scottsdale, and were very tame at Adventure Bay. They were easy to approach when feeding on the ground, or in small sapling eucalypts.

Lathamus discolor. Swift Parrot.—First noted from Mr. A. Butler's verandah; a small flock was flying from some flowering gums; noticed in fair numbers at Adventure Bay.

Neophema chrysostoma. Blue-winged Grass Parrot.—Several pairs of a *Neophema* were noted near Campbelltown and Ross. These were considered to be the Blue-wing Grass-parrot; but identity is not certain.

Dacelo gigas. Laughing Kookaburra.—One record only, in Epping Forest. This bird has been introduced into Tasmania, and is reported to be causing much destruction of the young of small native birds.

Cuculus pallidus. Pallid Cuckoo.—First heard on Tamar River, near Launceston. Common throughout trip; seen in numbers at Adventure Bay.

Cacomantis flabelliformis. Fan-tailed Cuckoo.—First heard on Tamar River, near Launceston, and seen almost everywhere. At Adventure Bay it was numerous; two fresh eggs of this Cuckoo were found in a nest of the Brown Scrub-Wren at Adventure Bay. The bird deserted the nest after it had been interfered with during inspection.

Lamprococcyx plagosus. Bronze Cuckoo.—Observed several times at Adventure Bay and Scottsdale.

Hirundo neoxena. Welcome Swallow.—Fairly numerous on mainland, but rarely seen at Adventure Bay; only one observation recorded. At Lillydale railway station a pair of these birds was rearing a brood on a rafter of the roof over the platform—a sheet of tin had been put up under the nest.

Hylochelidon nigricans. Tree Swallow.—A common bird at Adventure Bay, where the birds were busy rearing young in small hollows of eucalypts. They often flew over the sea beyond the line of breakers, even when a strong wind was blowing.

Petroica multicolor. Scarlet Robin.—Fair numbers were noted throughout the trip; also at Adventure Bay. Nest with 3 young found, 12.11.23, near Penguin Island; the nest was of usual construction, and placed 10 feet up in a fork of a small eucalypt. Female fluttered on ground near nest.

Petroica phoenicea. Flame Robin.—The common Robin of Tasmania, prefers open patches near forest country. Found breeding at Adventure Bay and Scottsdale; all nests found were built in a cliff or burnt-out dry log or upright tree with suitable cleft; evidently

the bird requires something like a roof over its nest. Nest with 3 eggs found on 20.11.23, built under a burnt-out portion of a tree trunk; the egg cavity of nest measured just 2 inches in diameter, by barely $1\frac{1}{2}$ inches in depth. It was constructed of very fine strips of stringy bark fibre, lined with grass, over which was added a final lining of fur and the brown woolly material from grass trees; outwardly the nest was decorated with cobweb and spiders' cocoons. It was placed 4 feet up from the ground.

Erythrodryas rodinogaster. Pink Robin.—First noted in National Park, near the Russell River Falls. Seen also in deep gullies near Adventure Bay. A broken egg-shell was found at the foot of a large tree fern in Russell Falls Gully, but the actual nest was not observed.

Amaurodryas vittata. Dusky Robin.—A common bird, prefers the open spaces near the forest lands, and chooses nesting sites similar to those of the Flame Robin. Breeding at Adventure Bay. Nest with 2 eggs in hollow, in the side of a small eucalypt. Egg-cavity measured barely $2\frac{1}{2}$ inches by $1\frac{1}{2}$ inches in depth. The nest was made of fine pieces of bark, rootlets and fine grasses, scantily lined with fine grass and hair, no outward ornamentation; placed 2 feet 6 inches from ground. Nest with 3 eggs found, 20.11.23, in cleft in large eucalypt, at a height of 12 feet from ground; nest of similar construction.

Rhipidura flabellifera. Grey Fantail.—A very common bird in Tasmania, and at our Adventure Bay camp. Nest being built at Adventure Bay on a horizontal branch, 10 feet up, in a stringy bark. Another nest in construction at Scottsdale very high up in large eucalypt.

Myiagra cyanoleuca. Satin Flycatcher.—Observed at Adventure Bay and Scottsdale. What a contrast the two sexes are!—the female with its rusty-throat and the male with his fine black-green metallic colour. The male was seen to elevate his crest-like feathers when annoyed. A pair noted at Scottsdale evidently were nesting, but no nest was observed.

Pachycephala pectoralis. Golden Whistler.—Noted near Cascades, Mt. Wellington, also at Adventure Bay; its beautiful song was often heard in the thickest patches in the gullies.

Pachycephala olivacea. Olive Whistler.—Several pairs of this fine bird noted at Adventure Bay; usually a very quiet bird.

Colluricincla harmonica. Grey Shrike-Thrush.—A common bird. Breeding at Adventure Bay and Scottsdale, both with two young in nest. Young almost ready to leave nest. The fledgling has the upper part brownish grey, the feathers round the eye and eye-brow are a pale rufous; the breast is striated.

Graucalus novae-hollandiae. Black-faced Cuckoo-Shrike.—A fairly numerous bird at Adventure Bay and Scottsdale. A nest fully 120 feet high was observed by watching the birds carrying material to nest. The nest was in a frail horizontal fork of a giant stringy bark, near Scottsdale.

Cinclosoma punctatum. Spotted Ground-bird.—Only record, a pair seen near "The Cascades," Mt. Wellington.

Calamanthus fuliginosus. Striated Field-Wren.—Seen at foot of Mt. Wellington, and at Scottsdale. Bird flushed from nest almost in ground under a blackberry bush; nest ready for eggs.

Oreocincla lunulata. Australian Ground-Thrush.—Fairly numerous in damp, secluded gullies. Young birds with parents were seen at Adventure Bay.

Epthianura albifrons. White-fronted Chat.—Seen on open lands from Ross to Bridgetown.

Acrocephalus australis. Australian Reed-warbler.—Heard near Launceston on River Tamar, both going and returning in s.s. "Nairana."

Acanthiza ewingi. Tasmanian Thornbill.—The *Acanthizæ* of Tasmania were rather a puzzle at first; but, after much observation, *A. ewingi* could be distinguished by its proportionately longer tail and legs and white edge of the wing, and its song, from its close ally, the Brown Thornbill (*A. pusilla*). *A. ewingi* is fairly common in gullies and close to the coast line. Its nests, with 3 or 4 young, were found in bracken fern; the nest being compactly constructed and well decorated with spiders' web and cocoons.

Acanthiza pusilla. Brown Thornbill.—In fair numbers, had evidently bred earlier than *A. ewingi*, as no nest with young was found; but at Scottsdale the second brood was being prepared for, as nests in course of construction were found.

Sericornis humilis. Brown Scrub-wren.—A very common bird in suitable localities. At Adventure Bay it was very numerous, and many nests were located; some in course of construction, with eggs and young. Known locally as the "Chocolate Wren." One nest contained two fresh Fantailed Cuckoo eggs. Nearly all nests were found hidden in sword or cutting grass. The nest is outwardly composed of decayed leaves and bark; the inner walls were of grass and the lining was of fur and feathers.

Acanthornis magna. Scrub Tit.—Mr. A. Butler was telling us at National Park the "observation" differences between this bird and the Thornbill, when a pair came right up to us. Indeed, this was the only view most of the party had of this fine bird of a distinct genus not found on the mainland. Another pair was observed on the Springs-road, to Mt. Wellington.

Malurus cyaneus. Blue Wren.—Common everywhere, and nesting freely.

Stipiturus malachurus. Emu Wren.—In a sword grass swamp almost in the town of Scottsdale, a few pairs of this beautiful bird were seen. They were evidently just starting to breed, as a new nest was being built in a small tuft of grass. In other suitable localities near Scottsdale, this bird was also found.

Artamus cyanopterus. Dusky Wood-swallow.—Fairly common; found nesting at Adventure Bay and Scottsdale.

Zosterops lateralis. Silvereye.—Found in small flocks at Adventure Bay, just commencing building operations. The bird appears darker in its under parts than those of the mainland.

Pardalotus striatus. Yellow-tipped Pardalote.—Common in forest lands in Tasmania, not plentiful on Bruny. Found nesting in a small hollow in a eucalypt at Scottsdale.

Pardalotus punctatus. Spotted Pardalote.—Noted at Hobart and Adventure Bay, where old nesting tunnels were found.

Melithreptus validirostris. Strong-billed Honeyeater.—Observed at National Park, Mt. Wellington, Adventure Bay and Scottsdale. Had evidently reared a brood of young earlier in the year. Runs up bark of trees, and has usual Treecreeper habits. Possibly this bird is responsible for some of the reports of a true Treecreeper (*Climacteris*) in Tasmania.

Melithreptus affinis. Black-headed Honeyeater.—Noted at Adventure Bay and Scottsdale.

Acanthorhynchus tenuirostris. Eastern Spinebill.—Found feeding young at Gorge, Launceston; nest with two eggs at Adventure Bay, 12.11.23; nest of fine shredded bark and lined with white fur and feathers, suspended on topmost twigs of a Prickly Moses (*Acacia verticillata*); height from ground, 15 feet. The nest measured 3 inches in diameter by 2½ inches in depth, and the egg-cavity barely 2½ inches in diameter by 1½ inches in depth.

Meliphaga flavicollis. Yellow-throated Honeyeater.—One of the commonest of the Honeyeaters, found throughout the trip. Found breeding—3 eggs; the nest is made of strips of bark and grasses

strongly woven together, the lining being of fur and cow-hair in a thick bed. It measured nearly 4 inches in diameter by 4 inches in depth, the inner cup was $2\frac{1}{2}$ inches in diameter by $2\frac{1}{2}$ inches in depth. The bird is a close sitter. The nest is built into a fork of a scrubby bush, and within a few feet of the ground. The peculiar note, resembling "chook-chook," can be heard in almost every scrub.

Meliornis pyrrhoptera. Crescent Honeyeater.—With "Egypt" coming from all points of the compass, one decides that this species is the most numerous of the Honeyeaters in Tasmania. It is, in fact, locally called the Tasmanian Honeyeater, though it is found also on the mainland. It is to be found in the trees in the streets of the towns, and is very tame; it was often heard calling just after daylight at our Adventure Bay camp. The birds had reared their first brood, and were building for the second family. As usual with our mainland bird, the female alone attended to nest-building. Nests in course of construction were made of strips of bark, dead leaves and grasses, the egg-cavity being lined at bottom only with hair and fur, and an occasional feather. All nests found were either in a clump of ferns or in cutting grass, and were within a few feet of the ground. Young birds closely resemble the adults, except that the black "crescent" on the chest is less distinct.

Meliornis novæ-hollandiæ. Yellow-winged Honeyeater.—Not at all common. Adventure Bay seemed a favourable spot for these birds, as several pairs were noted here. They had reared the first brood of young; nests are similar to those on the mainland.

Myzantha garrula. Noisy Miner.—Not seen at Adventure Bay; prefers the more open country, but was nowhere plentiful.

Anthochaera paradoxa. Yellow Wattle-bird.—Not often observed, once at Adventure Bay, where a nest was found by seeing the bird leave; no eggs were in the nest.

Anthochaera chrysoptera. Brush Wattle-bird.—Though supposed to be common in Tasmania, only one pair were seen at Adventure Bay, and another pair at Scottsdale.

Anthus australis. Australian Pipit (Ground Lark).—Fairly common on open or cleared country; found with young in nest.

Zonæginthus bellus. Beautiful Firetail.—Judging by the nests found, this species is very common in the Scottsdale district, though few birds were actually seen. They spend most of the time feeding on ground amongst the bracken ferns. Only a few birds were found at Adventure Bay.

Corvus coronoides. Australian Raven.—Not at all plentiful anywhere, and rarely seen at Adventure Bay. No specimens were collected, which, from an ornithological point of view, is regrettable, for if specimens taken all proved to be Ravens, it would help to settle the question whether we have more than one large Crow, as Tasmania has been credited only with the Raven.

Strepera fuliginosa. Black Bell-Magpie.—Only a few birds were seen at Adventure Bay, two of these were fed daily by timber cutters, and had their nest close to the sawmills in the hilly country; other birds were seen at Scottsdale.

Strepera arguta. Hill Bell-Magpie.—One morning, as Dr. Leach sat under the verandah of our camp house, at Adventure Bay, he saw a single representative of this species fly from a eucalypt near by—the only record of the trip.

Cracticus torquatus. Grey Butcher-bird.—More often heard than observed; its flute-like notes resounded from the hillsides.

Gymnorhina hypoleuca. White-backed Magpie.—Only one pair was seen at Adventure Bay, but in open country in Tasmania it is fairly numerous; it is a small form of our mainland bird.

Sparrows, Starlings, Goldfinches, and English Skylarks are to be found in great numbers in Tasmania.

Does Tasmania Possess a Second Species of Blue Wren (*Malurus*)?

By Miss J. A. FLETCHER, R.A.O.U., Lyeltya, Eaglehawk Neck, Tas.

Some ten years ago I was in charge of a school in the Springfield division of the Scottsdale district—to be more exact, from the beginning of 1911 to the end of 1915. I found this locality rich in Wren life, the rank, grassy flats near the rung-timber areas being in particular the especial haunt of these bonny birds, as well as those tracts where a sluggish creek meandered through an oozy swamp.

During the earlier part of the 1911 nesting season my attention was attracted by the richer colouring of some of the male *Maluri*, and I began to watch them as closely as my limited time permitted. I observed that some of these males wore more resplendent coats of black than the ordinary species (*M. gouldi*), and that, as a general rule, these were accompanied by a female Wren showing darker markings in the tail feathers and a richer brown on the head.

During the years I was stationed in this district, I found several nests of these birds, and all of them were more firmly built, more warmly lined, in which feathers formed a most conspicuous item of the lining, as well as being incorporated into the sides of the nest. Nearly every nest of these birds which came under my observation had worked into it the dark green moss that may be found growing at the foot of many trees and shrubs in damp situations.

On the other hand, the typical species (*M. gouldi*), even when nesting within a few yards of the birds under notice, kept to its usual type of nest in choice of materials, etc.

The eggs with the nests I found differed from the common variety in the warmer flush of their ground; this was retained even after blowing. My sister and I, when speaking of this (to us) new variety, distinguished it by calling it *elizabethæ*—the King Island form.

It does not call for a very vivid imagination to picture some of the Strait Island varieties finding their way to the northern portion of our island, and from there gradually travelling further inland along the rivers.

I endeavoured to obtain the services of someone to shoot a few specimens, but, as a rule, I had to wait the shooter's pleasure, and this did not always suit the easiest time to locate the birds.

A few were procured. I preserved these in spirits, and left several with Mr. A. L. Butler, of Hobart, and the others I took to Melbourne, and showed them to Mr. A. J. Campbell, leaving them with him.

I also took some of both kinds of nests. Mr. Campbell agreed with me that there was foundation for a belief in another variety, but said it would be better to obtain a pair of properly skinned birds. I was not able to do this in the season following; then the wider interests called forth by the war limited the time for field work, and in 1915 I was transferred to the North-West, and have not been able to take a trip to the old haunts since.

A few years ago, in some Devonport notes, written by Mr. Stuart Dove, he remarked on the intense blackness of a male *Malurus*, seen by him on the banks of the River Mersey, between Devonport and Latrobe.

Perhaps some of our local ornithologists may have noticed the differences I have brought forward. I believe Messrs. May and Ashby paid a flying visit to the Scottsdale districts some four or five years ago.

I had hoped to have been at liberty to revisit the Springfield district, but have not been free to do so yet. I have kept a few specimens of the nests and eggs of the two varieties, taking the nests from situations as close to one another as I could in the same season, so that the different choice of building materials might be readily noted. These alone support the suggestion of the presence of either the King Island or Flinders Island form.

I sent some specimens of the nests and eggs to Mr. Mathews, with a few notes. From these he listed a variety, giving as its habitat the Scottsdale and Ringarooma districts. The latter place—a continuation of the same class of country as the former—was included, because in one of my notes to Mr. Mathews, I mentioned having seen a finely coloured male *Malurus*, singing on the roadside in that locality.

I have brought some of the contrasting nests and eggs with me to the Conference, so that those ornithologists, who wish to do so, may have an opportunity of examining them.

EXTRACTS FROM MY FIELD BOOK OF 1911

26/9/11.—Saw a Wren to-day which, by its fuller toned plumage, suggested the King Island form.

1/10/11.—Cycled to Bridport. Noticed several more of the darker Wrens.

14/10/11.—Spent this morning watching for specimens of the darker *Maluri*. Saw several which appeared to have the whole of the wing black; others have the black extending, apparently in a line from the chest right down to the tail. In some instances the female accompanying these had dark blue tails; in others the brown appears darker.

In the afternoon my sister and I rode to the flats of the Brid River to hunt for nests of the Tasmanian Native Hen (*Tribonyx*). Whilst doing so, I found a Wren's nest on the margin of an island in the river. She had a dark blue tail.

The nest contained 3 eggs, and was more firmly built than that of a *Gouldi*. Her mate was not about.

Later, on our return, we saw a male *Gouldi* with her. Whilst watching them a fine "new" Wren appeared on the blackberries near by, but the ordinary Wren seemed to be her mate.

This nest with the eggs was eventually sent to the late Mr. Chubb, of the Melbourne Museum, together with a *Gouldi's* nest of the same locality for comparison with others in the Museum.

28/10/11.—Took a nest of Wren found previously on the 21st, when it held 2 eggs. We spent some time watching the birds of this nest, which was warmly made with moss and feathers worked into it.

A skeleton nest, found a week previously, was now completed, and held an egg. It was built in a tussock and adorned with the usual supply of dark moss and dark feathers. Both nests were in tussocks of the R. Brid flats. The first of these two nests was sent to Mr. A. J. Campbell, with a *Gouldi* nest from the same area.

Historical Associations of Adventure Bay.

By CLIVE LORD, F.L.S., Museum, Hobart.

Adventure Bay is but one of many beauty spots which fringe the coast of Tasmania. Its historical associations, however, lend an added charm to the romantic grandeur of the scenery, for it is doubtful if in any other bay in Australia has its history been so interwoven with that of the early explorers of the Great South Land. The dusky aborigines, searching for shell fish on the shores of the bay as far back as 1642, probably witnessed Tasman's attempt to anchor in this Bay with his two quaint ships belonging to the Dutch East India Company.

Over a hundred years later the French explorer, Marion du Fresne, passed along the South Coast, but it was not until March, 1773, that the first ship, of which we have record, actually came to anchor in the Bay. The navigator was Captain Furneaux, in the *Adventure*, and he named the Bay from his ship.

The island at the southern extremity was named Penguin Island, owing to a Crested Penguin—a chance bird—being captured there. Penguin Island, therefore, is the type locality of *Eudytes chrysocome*, and the Bay itself is also the type locality of many species, both botanical and zoological.

In 1777 Captain James Cook, during his third and last voyage to the southern seas, anchored in the Bay, and eleven years later the First Fleet sailed by on their voyage to found the first settlement in Australia. A few months later Captain Bligh, who had previously visited the Bay as Cook's sailing

master on the *Resolution*, anchored the famous *Bounty* here in August, 1788, Adventure Bay being her last port of call previous to the mutiny at Tahiti. Captain Cox, in the brig, *Mercury*, passed along the southern coast in 1789 and in 1792 Bligh once more anchored in the Bay. In the following year the French Admiral, Bruny D'Entrecasteaux, who had discovered the Channel a few months after Bligh's visit, anchored in Adventure Bay during the course of his second visit to Tasmania. Hayes (1793), also Flinders and Bass (1798-99) both passed by Adventure Bay without anchoring, but the Frenchman, Baudin, in 1802, remained here for a few days in the *Geographe*.

Another item of interest is the fact that at Adventure Bay were planted the first fruit trees in Tasmania, for Bligh planted apples and other trees along the shore during his stay. At a later period, during the twenties and thirties of last century, there were various bay whaling stations established, and on the shores of Grass Point there are to be seen to-day the remnants of old stone chimneys, etc., which mark the site of the old stations.

Adventure Bay, guarded at the northern end by Cape Frederick Henry and on the south by the great stony bastions of Fluted Cape, is worthy of note, therefore, for more reasons than one. Whilst the naturalist searches the shores or timbered slopes for specimens, he can ever and anon glance around and observe scenes of inspiring grandeur, whilst, letting his mind fall back through the past, he can reconstruct certain of the events which go to form the romance of the early history of our Commonwealth.

White's Journal of a Voyage to New South Wales.

By W. B. ALEXANDER, M.A., C.F.A.O.U., Sherwood,
Brisbane.

Read at Annual Congress, Hobart, Nov., 1923.

This well-known work, published in 1790, is of interest to students of Australian history, because it contains the journal of John White, the first Surgeon-General of the Port Jackson settlement, and contains one of the few first-hand accounts of the voyage of the first fleet, and of the happenings during the first six months of the new colony.

It is also of interest to naturalists, because it contains figures and descriptions of a number of the animals (birds, reptiles, fish), and plants met with at Port Jackson. It has generally been assumed that these descriptions were written by White himself, and the few scientific names proposed in the book are usually quoted as of White.

I have recently perused a copy of this work, kindly lent me by Dr. E. Marks, of Brisbane, and have discovered that this

assumption is incorrect, as the following particulars will show. The full title of the work, as given on the title-page, is:—"Journal of a Voyage to New South Wales, with Sixty-five Plates of Nondescript Animals, Birds, Lizards, Serpents, curious Cones of Trees, and other Natural Productions. By John White, Esquire, Surgeon-General to the Settlement." On the next page follows the dedication:—

"To Thomas Wilson, Esq. Dear Sir,—

As the following Journal was undertaken at your Request, and its principal Object to afford you some Amusement during your Hours of Relaxation, I shall esteem myself happy if it answers that Purpose.

I hope that the Specimens of Natural History may tend to the Promotion of your favourite Science, and that, on this Account, it will not be unacceptable to you. By the next Conveyance I trust I shall be enabled to make some Additions, that will not be unworthy the Attention of the Naturalists.

Let my present Communications, which the sudden sailing of the Ships from hence, and the Duties of my Department, have rendered less copious than I intended, at least serve to convince you of my Readiness at all Times to comply with your Wishes; and of the Respect and Esteem with which I am,

Dear Sir,

Your very obedient and humble servant,

JOHN WHITE.

Sydney Cove, Port Jackson, New South Wales.

November 18th, 1788."

Next follows an Advertisement:—

"It becomes the duty of the Editor, as much as it is his inclination, to return his public and grateful acknowledgments to the Gentlemen, through whose abilities and liberal communications, in the province of Natural History, he has been enabled to surmount those difficulties that necessarily attended the description of so great a variety of animals, presented for the first time to the observation of the Naturalist, and consequently in the class of Non-descripts. Among those Gentlemen he has the honour, particularly, to reckon the names of Dr. Shaw; Dr. Smith, the possessor of the celebrated Linnæan Collection; and John Hunter, Esq., who, to a sublime and inventive genius, happily unites a disinterested and generous zeal for the promotion of natural science.

The Public may rely, with the most perfect confidence, on the care and accuracy with which the Drawings have been copied from nature, by Miss Stone, Mr. Catton, Mr. Nodder, and other artists; and the Editor flatters himself the Engravings are all executed with equal correctness, by, or under the immediate inspection of Mr. Milton. The Birds, etc., from which the drawings were taken are deposited in the Leverian Museum."

This advertisement is a sufficiently explicit statement that the descriptions of the undescribed (non-descript) birds, animals, etc., are by the editor, not by White himself, and internal evidence absolutely confirms this, as I will indicate. It is nowhere definitely stated who the editor was, but I think there can be no doubt that he was Thomas Wilson, to whom, as we have seen, White sent his journal and specimens, and whose favourite science, as he mentions, was Natural History.

The descriptions of the new animals, birds, etc., are mostly given in an Appendix to the Journal, and it is only in the Appendix that true technical descriptions and scientific names appear. Some descriptions of birds are also interspersed in the text following a mention in the journal that such species were seen on a particular date. That the descriptions are inserted by the editor, and were not written by White, is manifest in almost every case, the only exception being that of the Emu, of which White himself evidently wrote a description, giving the result of his examination of the internal organs. In all other cases only the external features of the birds are described. It will be sufficient to quote a single example. On April 16, 1788, the following entry occurs in the journal:—"Saw this day the Anomalous Hornbill, of which a plate is annexed. This bird is so very singular in its several characteristics that it can scarcely be said to which of the present known genera to refer it." Then follows a detailed description of the bird, now called the Channelbill, followed by the statement:—"This singular bird was met with at New Holland, from whence three or four specimens have found their way to England, but whether it is a numerous species has not been mentioned."

This last sentence was obviously written by the editor in England, not by White, and it is very unlikely that White wrote the sentence stating that it was doubtful to which of the known genera it should be referred, as he did not claim to be a naturalist.

That the descriptions in the Appendix were not written by White is obvious, since in many cases White's name is mentioned. The first article in the Appendix is entitled, "The Different Species of Banksia," and, after giving an account of the discovery of the genus and discussing its affinities, the writer proceeds:—"Mr. White has sent imperfect specimens and seeds of four species of Banksia, which we have endeavoured to settle as follows."

The next article is on "The Peppermint Tree, *Eucalyptus piperita*," and on page 227 we find:—"The name of Peppermint Tree has been given to this plant by Mr. White on account of the very great resemblance between the essential oil drawn from its leaves and that obtained from the Peppermint. A quart of the oil has been sent by him to Mr. Wilson."

This shows that the botanical articles in the Appendix are neither by White nor by Wilson, and I think there can be no doubt that they are by Dr. Smith, to whom the editor expresses his obligations in his "advertisement," already quoted.

Towards the end of the Appendix (page 269), occurs the following sentence:—"The Non-descript Animals of New South Wales occupied a great deal of Mr. White's attention, and he preserved several specimens of them in spirits, which arrived in England in a very perfect state. There was no person to whom these could be given with so much propriety as Mr. Hunter, he, perhaps, being most capable of examining accurately their structure, and making out their place in the scale of animals; and it is to him that we are indebted for the following observations upon them."

This sentence, evidently by the editor, proves conclusively that the succeeding articles are by John Hunter, also mentioned in the "advertisement" quoted above. These articles deal with mammals, a spider, native weapons, and the feather of an Emu.

Between the botanical articles, which I conclude are by Smith, and those which are stated to be by Hunter, are articles on birds, reptiles, and fish, which differ from the others considerably in form, and especially in the fact that they introduce scientific names for the creatures described, and give a brief technical diagnosis in Latin and in English. I think there can be very little doubt that these are by Dr. Shaw, the third scientist whose assistance the editor mentions in his "advertisement." Shaw was at the time bringing out, in conjunction with Nodder, the *Naturalists' Miscellany*, a serial publication, which consisted of a series of coloured plates by Nodder, for each of which Shaw wrote a description in Latin and in English. The correspondence in style between the descriptions in the Appendix in *White's Journal* and those in the *Naturalists' Miscellany* is so striking as to leave no doubt in the mind of anyone who compares them that they are by the same author. I quote two to illustrate this:—

From the Appendix to *White's Journal*, page 262—

Small Paroquet.

Psittacus Pusillus.

Psittacus submacrourus viridis, capistro rectricumque basi rubris. Green Paroquet, with somewhat lengthened tail; the feathers round the beak, and the base of the tail feathers, red.

From the *Naturalists' Miscellany*, Description of Plate I—

Psittacus Porphyrocephalus.

Psittacus submacrourus viridis, vertice subcristato, purpureo-caeruleo, gula rubra.

The Purple-headed Parrakeet.

Green Parrakeet; with the tail rather elongated; crown slightly crested; and of a purplish blue; throat red.

The only possible obstacle to considering these descriptions as being by the same author is the different spelling of the word Parrakeet in the two cases. We may suppose that the editor of *White's Journal* preferred the spelling Paroquet, and altered it accordingly.

I conclude, therefore, that the descriptions of birds inserted in the text of *White's Journal*, and a few of those in the Appendix which are similar in style and without Latin name or diagnosis are by the editor, Thomas Wilson; and that the descriptions of birds in the Appendix with Latin name and diagnosis are by Dr. George Shaw.

It may be of interest to give lists of these. Those which I take to be by Wilson are as follows (Checklist name in bracket) :—

- Plate 1, page 129. New Holland Cassowary (name in text) or Cassowary of New South Wales (name on plate) = Emu (*Dromaius novaehollandiae*).
- Plate 2, page 137. Great Brown King's Fisher = Kookaburra (*Dacelo gigas*).
- Plate 3, page 139. Banksian Cockatoo = Red-tailed Black Cockatoo (*Calyptorhynchus banksi*).
- Plate 4, page 140. Blue-bellied Parrot = Rainbow Lorikeet (*Trichoglossus moluccanus*).
- Plate 5, p. 142. Anomalous Hornbill = Channelbill (*Scythrops novaehollandiae*).
- Plate 6, page 144. Wattled Bee-eater = Red Wattle-bird (*Anthochaera carunculata*).
- Plate 8, page 146. Golden-winged Pigeon = Bronzewing (*Phaps chalcoptera*).
- Plate 9, page 157. Port Jackson Thrush = Grey Shrike-Thrush (*Colluricincla harmonica*).
- Plate 10, page 161. Yellow-eared Flycatcher = (?) Yellow-faced Honeyeater (*Meliphaga chrysops*).
- Plate 11, page 168. Tabuan Parrot, Male = King Parrot (*Aprosmictus scapularis*).
- Plate 12, page 169. Tabuan Parrot, Female = King Parrot (*Aprosmictus scapularis*).
- Plate 13, page 174. Pennantian Parrot, Male = Crimson Rosella (*Platycercus elegans*).
- Plate 14, page 175. Pennantian Parrot, Female = Crimson Rosella (*Platycercus elegans*).
- Plate 15, page 186. New Holland Creeper = New Holland Honeyeater (*Meliornis novaehollandiae*).
- Plate 16, page 190. Knob-fronted Bee-eater = Leatherhead Noisy Friarbird (*Philemon corniculatus*).
- Plate 17, page 193. Sacred King's Fisher = (*Halcyon sanctus*).
- Plate 7, p. 240. Wattled Bee-eater, Female = Brush Wattle-bird (*Anthochaera chrysoptera*).

This last was thought to be the female of the Red Wattle-bird.

Those descriptions which I take to be by Shaw are as follows:—

Plate 26, page 237. Crested Cockatoo (*Psittacus cristatus*, Lin.) = White Cockatoo (*Cacatua galerita*).

Plate 27, page 238. White Fulica (*Fulica alba*) = White Swamphen (*Porphyrio alba*), of Lord Howe Island.

Plate 28, page 239. Southern Motacilla (*Motacilla australis*) = Yellow Robin (*Eopsaltria australis*).

Plate 29, page 241. Crested Goat-sucker (*Caprimulgus cristatus*) = Owlet Nightjar (*Aegotheles cristata*).

Plate 35, page 250. White Hawk (*Falco albus*) = White Goshawk (*Astur nova-hollandiae*).

Plate 36, page 251. White-vented Crow (*Corvus graculinus*) = Pied Bell-Magpie (*Strepera graculina*).

Plate 37, page 252. Fuliginous Peteril (*Procellaria fuliginosa*) = White-chinned Petrel (*Procellaria æquinoctialis*).

Plate 41, page 256. Superb Warblers (*Motacilla superba*) = Blue Wren (*Malurus cyaneus*) and Variegated Wren (*M. lamberti*).

Plate 42, page 257. Small Motacilla, or Warbler (*Motacilla pusilla*) = Brown Thornbill (*Acanthiza pusilla*).

Plate 48, page 262. Small Paroquet (*Psittacus pusillus*) = Little Lorikeet (*Glossopsitta pusilla*).

Plate 49, page 263. Red Shouldered Paroquet (*Psittacus discolor*) = Swift Lorikeet (*Lathamus discolor*).

The above scientific names should, I think, be quoted as of Shaw in White's Journal, *e.g.*, *Eopsaltria australis*, Shaw in White's Journal of Voyage to New South Wales, p. 239. If the arguments set forth above are not considered sufficient to prove that the names are due to Shaw, they should be quoted as anonymous. They are clearly not due to White, though they have always hitherto been regarded as his.

As I have had occasion to refer to Shaw and Nodder's Naturalists' Miscellany, I take this opportunity to point out that the names in that work should be quoted as of Shaw, not as of Shaw and Nodder, as Mr. Mathews does in his various lists.

The title-page of the copy of Vol. I. in my possession is as follows:—"Vivarium Naturae, or the Naturalists' Miscellany. Vol. I. dedicated by permission to Her Majesty. By G. Shaw, M.D., F.R.S. The figures by F. P. Nodder, Botanic Painter to Her Majesty."

One other point in connection with the birds figured in White's Journal is of interest. Plate 27, illustrating the White Fulica (*Fulica alba*), of Lord Howe Island, shows the bird with a spur on the wing, and the accompanying description

states:—"The shoulders are furnished with a small crooked spine." In the *Birds of Australia*, Vol. I., pages 247-255, Mathews discussed this bird very fully, and concluded that it must be referred to the genus *Porphyrion*. In the *Austral Avian Record*, Vol. II., pages 15-16, Iredale endorsed this view from his examination of the unique specimen in the Vienna Museum, which is believed to be the one from which the figure in White's Journal was drawn. Neither of them, however, mentions the spur on the wing. If it was present it would surely constitute a character entitling the bird to be placed in a genus by itself. If it is not present in the Vienna bird, how can its representation in the figure and its mention in the description be accounted for? Mathews begins his account by stating that "probably as much has been written about the 'White Gallinule' as any bird." That being the case, probably others have noted the spur on the wing. But as none of the works quoted by him, other than White's Journal, is accessible to me, I draw attention to the point.

Singular Nesting Sites of Birds of the Nullarbor Plain.

By ELLIS L. G. TROUGHTON, R.A.O.U., Zoologist, Australian Museum, Sydney.

(By Permission of the Trustees of the Australian Museum.)

Read at Annual Congress, Hobart, Nov., 1923.

While on a collecting expedition on behalf of the Trustees of the Australian Museum in 1921, Mr. J. H. Wright and I were stationed at Ooldea, on the Trans-Australian Railway. Ooldea is situated on the eastern edge of the vast Nullarbor Plain, which the train enters immediately west of the station, and traverses for about three hundred miles.

During our stay of several weeks, we made many excursions into the plain in search of birds and mammals of any description. Scattered over the plain within a radius twelve miles west of Ooldea, are slight depressions, which have the appearance of shallow lake beds, where the soil is softer and the low monotonous blue bush gives place to thick, rank grasses and clumps of stunted scrub. These depressions, "dongas" or "dongholes," as they are called, though only watered in times of heavy rain, must seem havens of refuge to the animal life of the plain, which we found, to our relief, prone to congregate in them. Indeed the struggle for existence and accommodation must be extremely keen, as the following notes will indicate.

Perhaps the most interesting denizen of the plain is a species of "Stick-nest Building Rat" (*Leporillus conditor*)—Gould—specimens of which were first secured by Sturt on the

Lower Darling in 1844. These rats* are in the habit of constructing cone-like nests of sticks which are often closely interwoven with the trunk and limbs of a stunted bush when suitable shrubs are available, the whole forming quite a massive stronghold against the strong winds, dingoes, and other enemies.

Upon nearing one of the dongholes, many of which had several stick nests in them, we saw a Hawk rise suddenly from a low bush. Closer inspection proved the bush to be the support of a typical rat's nest (Plate 33), with a neat depression at the apex, which housed three eggs of the Striped Brown Hawk (*Ieracidea berigora*). The association was truly a strange one, and it is difficult to imagine what pact or understanding brought about an *entente cordiale* between these apparently ill-matched householders.

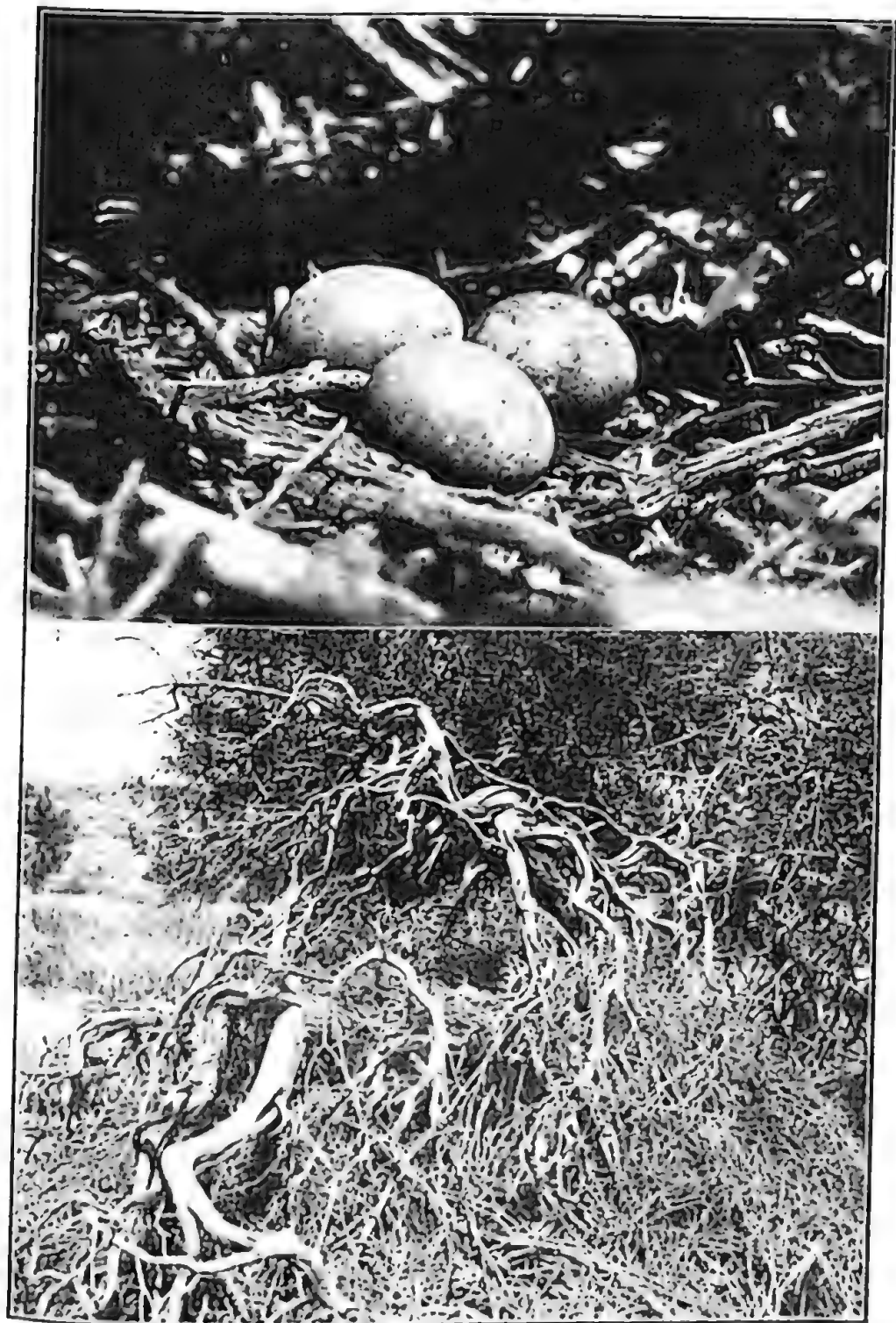
Bones littered within the rat's nest suggested a tendency to a meat diet on their part, and most rats are partial to birds' eggs. On Lord Howe Island, for instance, the depredations of the common introduced rat (*Rattus rattus*) have almost exterminated the valuable and interesting bird fauna. There the rats eat both the eggs and young of insectivorous birds, so that many hitherto harmless insects have become pests. A notable instance of this is the Scolytid Beetle (*Dryocoetes dactyliperda*), which bores through and destroys a considerable percentage of the exportable Kentia Palm seeds, upon which the islanders are largely dependent.

On the other hand, there are many records of the penchant of the Striped Hawk for a quadruped diet, such as small rodents and marsupials, and one might reasonably suppose that this Hawk would, under ordinary circumstances, be very partial to the rats for food.

Though it has often been noted that the Hawk in question occasionally uses the old nest of another Hawk or Raven, this instance of a Hawk utilising the nest of a mammal must be as unique as are the stick nests of the rats themselves.

Whatever may be the explanation for the apparently mutual understanding between the Hawks and rats of the one nest, no such truce exists between the Delicate Owls (*Tyto alba*), and rats living on the Nullarbor Plain. The Owls make their homes in the limestone caves or "blowholes" which honeycomb the plain. Though the openings of these blowholes are sometimes too small to allow a man to enter, they usually open out into a fair-sized chamber, from which small crannies are given off; their name is derived from the surprisingly strong wind, often redolent of stagnant water and drying owl pellets, which blows up from the crannies and out through

*A detailed account of the interesting stick-nest building rats of Australia may be found in my "Revision of the genus *Leporillus*," in the Records of the Australian Museum, XIV., 1, 1923, pp. 23-38, pls. V.-VI.



Upper : Eggs of Striped Brown Hawk (*in situ*).

Lower : Nest and eggs of Striped Brown Hawk on the nest of the Stick-nest Rat.

Photos. by E. L. G. Troughton, R.A.O.U., Sydney.

the openings above. According to popular local report, the air is at times drawn strongly inward, the reversed direction of the draught being attributed to the action of the tides, some sixty miles away.

These Owls must constitute an even more dreaded enemy of the rats than the dingoes which traverse the plains at certain seasons, but which would be unable to tear apart their strongly woven fortresses. One can picture the Owls with soft, almost noiseless flight, swooping down out of the desert night, and clutching up some hapless rat busily engaged upon a foraging expedition or in house repairs.

Indeed, great numbers of indigenous rats and mice must be consumed, as we found Owls roosting in many of the blow-holes, and collected a good many of their castings, the majority of which contained complete skulls of the Stick-nest Rat. Variety is lent to the menu by the smaller species of rodents and marsupial mice, skulls of which were found in a number of the Owl-pellets examined.

Thirty Owls have been introduced to Lord Howe Island during 1923 by the Island Board of Control, to assist the campaign against rats, and already there are definite signs that the birds are destroying rats. Owls are frequently seen and heard about the island and its homesteads, and pellets containing rats' skulls have been found, proving that the birds are at work.

Twelve miles westward of Ooldea the dongholes gradually disappear, and the landscape at Fisher, about forty miles farther on, is very flat and fairly well covered with bushes, which are only about knee-high. These bushes are too frail to support birds' nests of any dimension, nor do they supply adequate builders' material for the rats' self-contained flats, and so the residences of the latter change to low heaps of sticks over rabbit warrens.

In this locality the birds are hard put to find suitable nesting sites, a problem which was solved at Fisher, where we were camped, in a novel manner by pairs of Striped Brown Hawks and Short-billed Crows (*Corvus bennetti*).

The single line system of the Trans-Australian Railway does not necessitate a continuous set of signal posts, which are limited to several at either end of the sidings. Each pair of birds had chosen the top of a signal post, at the junction of the arm, for a building site, and as the signals were never operated, the trains only stopping to drop such important things as stores and collectors, the birds raised healthy families, and voted their home site a signal success.

In conclusion, I wish to express the thanks due to my friend, Mr. J. R. Kinghorn, Ornithologist of the Australian Museum, who kindly gave his expert assistance in the identification of the birds noted above.

Further Notes on the Red-Eyed Bulbul

By Dr. JOHN MACPHERSON, R.A.O.U., Macquarie Street,
Sydney.

Read at Annual Congress, Hobart, Nov., 1923.

From January to September of this year (1923), I resided in Double Bay (Sydney), close to my former residence, and had excellent opportunities of observing this bird (*Otocompsa jocosa*) at close quarters. Unfortunately, I left before the nesting season. The bird has greatly increased in numbers, and extended its distribution. On April 1st, I counted eighteen at one time in the garden. Many were obviously much younger in age than the others. They were seen, not only in Double Bay, but also towards Rushcutters' Bay, and the farther end of Darling Point. From the middle of June to August 1st I saw none, but occasionally heard them in the distance. They were mostly seen about noon and the early afternoon; not so often in the late afternoon or early morning.

The red about the vent was conspicuous, but the red behind the eye was not clearly discerned unless the bird was close. The white and brown (sometimes almost black) on the tail were well marked as the bird occasionally spread out the tail just before alighting. The crest was generally likened by observers to a dunce's cap. The younger birds had only scanty, straggling crests. During flight, and sometimes as the birds flitted through the foliage of the trees, or remained perched, the top-knot was directed well backwards. The voice did not so often contain the challenging note I previously observed. Often the birds were quite silent, or indulged in much low chattering, during which the throat was seen to swell greatly. Some of the notes were harsh or shrill and whistling. Occasionally one or two single notes were uttered, not at all unlike those of the Starling, which is exceptionally plentiful in the same areas. Could this be imitative? The flight was always low—never high like that of the Starling. The posture was not always erect, but often the bird perched in a hunched position, with the head well down between the shoulders. A favourite position to preen its feathers was on the topmost twigs of the Camphor Laurels. Its habits are sociable; small companies generally move about together. It is restless, constantly moving about. But it is not very timid, and many disported themselves within a few feet of the open window at which we sat. They made a very charming picture as they flew actively about the Camphor Laurels, lilli-pilli (*Eugenia*), and Pepper Trees (*Schinus molle*), or perched on the Poinsettias, or plunged deeply into the Honeysuckle and other dense creepers. Sometimes they seemed to be everywhere—amidst the foliage or low down on the trunks of

the trees, the telephone and electric lighting wires, the fences, gate-posts, and even on the ground of the garden and foot-paths.

As regards their food, they appeared to pick aphides or other insects from the creepers on the fences, but did not attack the beautiful blue-and-black marked Butterfly (*Papilio sarpedon chloredon*), which fluttered about the Camphor Laurels. Unlike the Silver-eyes they did not eat the drupaceous fruit of the Pepper Tree, although they would tear off small twigs with foliage and beat them against the trunk. Nor did I see the Loquats touched; but I was informed that they devoured the Guavas in an adjoining garden. There have been many references in the Press to their destructive onslaughts upon Peas, Figs and Strawberries, but in Double Bay their favourite food was, in the Autumn, the drupaceous fruit, popularly termed "berries" of the Camphor Laurel. In this quest they competed with the Silver-eyes, Starlings and Rosella Parrots, all of which eagerly devoured this fruit. The drupe of the Camphor Laurel is about $\frac{1}{2}$ in. in diameter, and weighs about nine grains. It contains a "stone" $\frac{1}{4}$ in. in diameter, and weighing about three grains. The outer layer of the stone (endocarp or putamen) is dark brown and hard, but brittle. The enclosed seed is somewhat firm and yellow. The epicarp, when unripe, is green; when ripe, a rich blue-black. The pulp is soft. These fruits were eaten readily both green and ripe. Two or more were swallowed, quickly, one after the other. They were not broken up or masticated, but just held momentarily in the beak, and then swallowed whole. In tearing off the fruit, the birds often fluttered and hovered like honey-eaters, frequently unsupported in the air, or again hanging head downwards.

Crow and Pelican.—On a recent trip to Forster in the motor launch, I saw a rather uncommon sight. On the run down the lake a fishing boat was passed, and floating outside the net I saw a dead Pelican, evidently shot by the fishermen, as these birds will follow a net in and do great damage to the net by tearing the fish out with their enormous beaks, for which the fishermen levy heavy toll if they get the chance. Returning later in the day, I saw a peculiar-looking object ahead of the launch. This was right in the middle of the big lake, and the water was very rough, with a big sea running. On coming up to the object, I saw a Crow perched on the breast of the Pelican, dining very much at his ease, despite the rough water. The Crow flew off as the launch drew near, but returned after we had passed, and went on with the feast. Where will these birds not go?—J. F. H. GOGERLEY, R.A.O.U., Ellerslie, Wallis Lake, N.S.W.

Note on the Dark Thornbill (*Geobasileus hedleyi*), with Description of its Nest and Eggs.

By A. J. and A. G. CAMPBELL, M's.R.A.O.U., Melbourne.

Geobasileus hedleyi winiamida, F. E. Wilson.

Type description, female, *Emu*, Vol. XVI., p. 169 (1917).—Male taken Winiam, Vic., Aug. 29, 1923.

Upper surface dark greyish olive, becoming olive on rump; forehead crescents light buff, each feather with blackish base and dusky fringe; upper tail coverts clay color; wings fuscous with outer webs lighter; tail black with fuscous base, some white on tips of three outer feathers; lores, olive buff; ear coverts fuscous with olive buff centres; under surface dark olive buff generally, with tendency to whitish on throat, with dark fleckings, and cream buff on abdomen; eyes creamy; bill and legs black. Length, 3.7in.; bill, .3in.; wing, 1.9in.; tail, 1.5in.; tarsus, .8in.

Mr. Wilson, in describing this Thornbill, which is the only addition to Victorian species for some years, makes comparison between it and *G. tenuirostris*,* Zietz, from South Australia. Therefore, G. M. Mathews, in *Birds of Australia*, Vol. IX., places it as a synonym, or a sub-species.

Previously, Mr. Mathews had described a new species—*Acanthiza hedleyi*—from Meningie, near the mouth of the River Murray, S.A. (see *Aus. Avi. Rec.*, Vol. I., p. 78, 1912). This is figured in *Birds of Australia*, Vol. IX., pl. 453, top figure (1922). It thus would appear that *hedleyi* and *winiamida* are one and the same species. There is unlikely to be any difference between the two, seeing they inhabit open, sandy moorlands in adjacent portions of South Australia and Victoria, known as the Coorong Desert, to the west, and the Little Desert, at the eastern extremity.

The bird above described differs specifically from *G. tenuirostris* in the different tone of the back, having smaller crescents on forehead, and less white on tail, while the under surface is very much darker. (See A. G. Campbell, *Emu*, ante, p. 30)

The prominent feature of the throat and breast is that the faint dusky fringes to the feathers noticed in many *Geobasileus* become so pronounced and prominent that they assume the appearance of distinct fleckings or striations, after the manner of the Striated Thornbill (*Acanthiza lineata*).

The bird differs from *G. reguloides*, the next nearest relative, by not having the base of the tail buff like upper coverts.

The bird's call is "teow-teow," with a sharp "tsis-tsis," when alarmed. We found the species shy and wary.

It is interesting to record that the Buff-tailed Thornbill (*G. reguloides*) is common at Winiam, near Nhill, but it has a

*A pre-occupied name; now *G. iredalei* Mathews.—Eds.

duller upper surface and much more restricted color patch on rump and tail than is typical of that species, indicating a change to a pallid race. However, it inhabits the timbered country only, and does not go on to the banksia moorlands, where the only birds met with are usually the Tawny-crowned Honeyeater (*Glyciphila melanops*), *Geobasileus h. winiamida*, and a Field-Wren (*Calamanthus*).

Nest.—Covered, with top-side entrance slightly hooded; composed chiefly of weather-beaten grass stems mixed with a few spiders' or insect cocoons; and warmly lined with small feathers. Interwoven in the body of the nest is an Emu-feather and its after-shaft. Upright diameter, $4\frac{1}{2}$ in. (115 mm.); breadth, about 3 in. (75 mm.). Situated near the ground in a banksia bush.

Eggs.—Clutch, three; ovate in shape; texture of shell very fine; surface glossy; colour, white, minutely freckled or "dusted" with light brick red in the form of a zone round the apex. Dimensions in millimetres:—(1) $16 \times 11\frac{1}{2}$, (2) $15\frac{1}{2} \times 11\frac{1}{2}$, (3) $15\frac{1}{2} \times 11\frac{1}{2}$.

The eggs are suggestive of those of *A. reguloides*. Although the type specimens (having been discovered by Mr. Robert Oldfield, Winiam, Sept. 17, 1923), they were unfortunately too heavily incubated to make cabinet specimens.

Notes on the Tasmanian Emu.

By H. STUART DOVE, F.Z.S., R.A.O.U., West Devonport,
Tasmania.

Just recently I have got into touch with one of the pioneer settlers of the Emu Bay district, about 30 miles west of Devonport, North-West Tasmania, and asked him if he had any information as to the naming of the Emu River and Bay, and whether these birds were in early days plentiful there. The naming of these localities long antedates my correspondent's recollections, which go back 60 years or so, but he has told me the circumstances from old records. It seems that H. Hellyer, the first surveyor of the Van Diemen's Land Co., was crossing the Hampshire Hills, which lie to the south of Emu Bay, when he came upon a stream, on the soft banks of which were the imprint of Emus' feet; after describing the course of the river, he says in his report:—"I have since named it the Emu." He afterwards traced the stream down to the coast, and finding that it fell into a large bay, named the latter Emu Bay; this was in February, 1827.

My correspondent at "The Bay," as it is familiarly called by old settlers, does not think that the birds were ever seen there, as it was all dense bush in the early days, whereas "the Hampshire" was more open and park-like, just the country that the Emu would frequent. My old friend also states that a couple of Tasmanian Emus were kept for some time

in captivity at the Van Diemen's Land Co.'s settlement at Circular Head (now Stanley), about 52 miles west of Emu Bay (now Burnie); but there seems to be no record as to what became of them.

In the *Tasmanian Mail* of Nov., 1922, there appeared some notes by Mr. B. R. Dyer, of Battery Point, Hobart, in which he says that his recollections extend back 65 years, and include the remembrance of two Tasmanian Emus on Mr. R. C. Kermode's estate, in front of the mansion at Mona Vale, in the Tasmanian Midlands; one of these knocked him down and trampled on him, until he was rescued by Mr. Kermode. Another of these island-natives was kept in a paddock in front of the women's quarters at the New Norfolk asylum. Mr. Dyer says that they were never plentiful, *a few on the plains of the North-West Coast, near Emu Bay*, and some at New Ground, near Marlborough, a few miles beyond New Norfolk.

If these captive birds of 1859 were undoubted island-natives, they must have been the last of the race, as the majority seem to have been killed off by 1850. The two skins in the British Museum collection (Ronald Gunn, collector) bear date 1845, and none of the Colonial Museums seems to have specimens. It is very remarkable that no efforts appear to have been made to preserve the remains of the Mona Vale and New Norfolk captives; although it must have been known that the species was on the point of extinction.

Our island bird is said to have been a little smaller and much darker than the mainland form.

In looking through James Fenton's *Bush Life in Tasmania Fifty Years Ago*, I have just come across another reference to our extinct species. It seems that Henry Hellyer, chief surveyor to the Van Diemen's Land Co., actually saw the birds themselves, as well as their footprints. He had gone into the totally unexplored country south-east of Circular Head, had ascended and named St. Valentine's Peak (14th February, 1827), discovered a river, and named the Surrey and Hampshire Hills. The natives had been burning large tracts of grass, and native huts were found, with several trees from which bark had been taken to cover them. On 15th February he writes:—"A brook runs across from the peak in a south-easterly direction, the banks of which are green with trefoil. About sunset, having routed some Emus, we fired at them without impeding their progress." Fenton comments:—"It is a very singular fact that those Emus have all disappeared from *some unknown cause*. I never saw any, and only heard of one being seen near the Leven, in 1839." As Fenton knew this coast in 1838, the birds must have suffered a very early extinction.

NATIONAL MUSEUM OF MECHANICS



Tree at Augusta, Blackwood River, W.A., under which is the grave of the first white settler, who died about 1830.

Wensleydale, Broome Hill, Homestead amongst white gums
(Wandoo Trees)

Photos. by Tom Carter, M.B.O.U.

Birds of the Broome Hill District.

By TOM CARTER, M.B.O.U., Sutton, Surrey, England.

Part 2.—continued

Cacatua tenuirostris pastinator. Western Long-billed Cockatoo. (Aboriginal, Mannich or Mennich).—These interesting birds are now "few and far between," in South-Western Australia, where they abounded in the early days of settlement. Some of the original settlers around Broome Hill told me how, when boys, they had been sent out by their fathers to frighten the flocks away from the corn crops, to which these birds were most destructive. They dug up the newly-sown grain with their long pointed mandibles, pulled up the young plants to obtain the seed grain, and later on in the season settled in flocks on the full-grown stalks, and flattening down the crop. They also ate the ripened grain as it stood in sheaves after being cut. In consequence of these depredations the farmers strewed poisoned corn in such a wholesale manner that most of these Cockatoos were destroyed, and for many years now only an occasional pair, or a small party, could be seen in the extreme south-west, excepting around Lake Muir, where considerable numbers bred until 1912, as I have described in the "Ibis," 1912, p. 627, to which paper I must refer my readers who require fuller details. In the season when corn is not available, these birds feed on bulbs dug from the ground, and also on various berries. The nesting season commences early in September, and Red Gum trees (*Eucalyptus calophylla*) are usually chosen for nesting cavities, although Jarrah trees are generally more numerous. Living trees are preferred to dead ones. Two or three eggs are the usual clutch, and the same nesting cavity is often used, probably by the same pair of birds. The young remain in the nest until they can fly well, and I noticed that a sitting bird will often leave the eggs when anyone approaching is still some distance away from the nesting tree. Since my "Ibis" paper appeared, I have made the following notes:—June 24/13, a pair were seen about 30 miles south-east of Broome Hill; Jan. 23/16, a few were seen at Lake Muir. I shot two (to eat) from a party in the top of some large Yate trees, and found their crops almost full of honey from the blossoms of the trees; a few grains of wheat were also in their crops; March 11/16, observed a small flock flying past Augusta on the lower Blackwood River; a resident told me that many could still be seen further to the south; Feb. 11/14, a few bred the former year (1913) between Lake Muir and the Great Southern Railway, and Mr. R. Muir (my informant) took a young bird, the only one, from a nesting cavity high up in a Red Gum tree; March, 1919, not a single Cockatoo was seen at Lake Muir on that visit.

Polytelis anthopeplus. Smokers (Regent Parrots) were first seen by me Jan. 21/12, when several small flocks were feeding on the seeds of "Jam" trees (*Acacia acuminata*), some of them close to my house. Some flocks consisted of about 20 birds. They were exceedingly wild at first, but after a few days could be approached closely, especially in the heat of the day when they rested in the foliage of the Jam trees. When these birds perched in the larger trees, they kept their bodies in line with the branch, and not across it. They uttered a rather harsh, grating note, which somewhat resembled that of the Red-capped Parrot. Jan. 24/12, these Parrots were, between 4.30 and 6 p.m., flying about in parties of five or six in an excited state, and few were seen after then. The last party was observed by me on February 3rd, and a single bird on March 12. I was told that many had been seen

on the Pallinup River. Old settlers told me they had previously seen similar visitations, but at intervals of several years. In February, 1922, I was fortunate in seeing another visitation of these Parrots on a large scale. I had been told that hundreds of them could be seen on the Gordon River, and places twenty-five miles west of Broome Hill, and between March 3 and 14, when I was staying at and beyond Gnowanerup, 25-30 miles east of Broome Hill, I had the pleasure of seeing these birds in flocks of many hundreds, as they got water at the excavated tanks for stock. I also saw small parties in timber on the sandplains, but they were wild and could not be closely approached.

Purpureicephalus spurius. Red-capped Parrots were fairly common at Broome Hill, and were generally distributed through the South-West, but the only locality where I saw them in great numbers was at Collie, on the Collie River (80 miles north-west of Broome Hill) in February, 1916, when hundreds were eating fruit in the orchards and causing much damage; scores were shot daily. The settlers there called them Hook-bills, or Grey Parrots, as many of them were in immature plumage. The above names were purely local ones, as these birds are elsewhere always known as King Parrots. As a rule, they are generally seen in pairs, or as a family party after the breeding season. They were often seen feeding on the ground near Broome Hill, especially under Marlock scrub, and were usually very wary. They have a peculiar harsh, grating cry, unlike that of any other Parrot known to me. The breeding season is September and October, and nesting cavities that came under my notice were never less than thirty feet above the ground. Oct. 26/08, a pair was nesting at Broome Hill in a hole thirty feet from the ground in a White Gum tree; the hole was four inches in diameter, and young birds could be heard inside it; Nov. 24/08, as adult birds were seen again about the above tree, it was cut down, and one fresh egg was found inside the nesting cavity. It was probably the beginning of a second laying; Nov. 24/08, another nest containing four half-grown young was found; Sept. 11/10, took a female with ovaries much enlarged; Sept. 29/10, young birds seen in nest at Magitup (east of Broome Hill). During my tour through the South-West in February-March, 1919, these Parrots were remarkably scarce, only five being seen, viz., a pair at Gnowangerup, two near Brunswick, and one at Lake Muir. I was told on good authority that they breed at Ravensthorp, one hundred and fifty miles east of Broome Hill. During my recent visit to South-West Australia, I saw these birds only on two occasions, both being in the vicinity of Cape Naturaliste (February-March, 1922). As far as is known at present, the Red-capped Parrot occurs only in the south-west area of West Australia.

Barnardius zonarius semitorquatus. Yellow-collared Parrots (Aboriginal, Tow-Errin) are by far the commonest Parrots from east of Broome Hill, through the whole south-west corner now under consideration. The numbers annually shot at orchards must be immense, as also the amount of fruit destroyed by them. As is already well known, these Parrots vary much in colour, and also size, in various districts, so I will attempt no classification, but give my notes. In February, 1910, I stayed some time on the Warren River. A large and fine orchard (I believe about the oldest one in West Australia) was close to his house, and all round was dense forest, consisting mostly of the giant Karri trees, that average about 200 feet in height, and sometimes reach 300 feet. In the course of my short visit, I examined hundreds of birds, and found that, with one exception, all had green breasts and abdomens, the other one having a slight ventral band of yellow. Birds from Wilson's Inlet had all green underparts. February, 1916, I examined some scores shot in orchards at Collie, and found that all had green bodies with a very narrow ventral band of yellow.

February, 1916, several shot at Bridgetown had distinct yellow ventral bands. (Bridgetown is about thirty-six miles south of Collie, and eighty miles west of Broome Hill.) These Parrots occurring about Broome Hill, and east of there, all appear to have yellow ventral bands to some extent, but are not of such a deep green on the mantle and breasts, and have much less red on the forehead than the birds further south and west. These Parrots are exceedingly wary and quiet in their nesting habits, and I never succeeded in finding a nest, and although I offered a good reward to Broome Hill boys for any eggs brought to me, they never found any. The breeding season commences early in September, and I have notes of recently fledged young having been seen on Nov. 18/06, Nov. 20/08, Sept. 29/10, Dec. 2/12, in the vicinity of Broome Hill; the local name is "Ring-neck."

Barnardius zonarius woolundra. Mathews described the Yellow-collared Parrots that occur about Woolundra (Goldfields Railway) as "differing from *B. z. semitorquatus* in having a broad yellow band on the lower breast, in being much lighter in colour on the back, and the vent a much lighter green." This was from a series of skins collected there by myself on several visits. These birds have the same habits and partiality for fruit as the rest of the genus, but I never heard the Woolundra birds utter the familiar "twenty-eight" cry. They appear to be the connecting link between *B. semitorquatus* of the extreme South-West, and *B. zonarius occidentalis* that occurs about Geraldton (200 miles north of Woolundra).

Psephotus varius. Varied Parrots were seen in small parties on May 22, 1919, by Mr. B. W. Leake and myself at large salt-lakes near Woolundra.

Neophema elegans. Elegant Grass-Parrots were fairly common at Broome Hill, during my residence there, but on subsequent visits I saw hardly any, and have a note in my journal for 1919 (February-March) that the only ones seen were about six, perched on the telegraph wires alongside the high road to Gnowangerup. I never found any nests, but saw recently fledged young, Dec. 11/08, and Dec. 2/12, so apparently they are late breeders. A lady at Broome Hill had a caged bird that laid five eggs in November, and again four in December of the same year, which second clutch she kindly gave me. I have no recollection of having seen any of these Parrots in the South-West corner.

Neophema petrophila. Rock-Parrots were common along the rocky beaches near Cape Mentelle in October, 1902, and were breeding in crevices under the rocks, but none was seen there in March, 1916, but several were seen on the rocky promontory of Cape Leeuwin, and the chief light-keeper told me that they bred there. In April, 1919, only one was seen there, and in January, 1923, when I spent some time examining the coast from Cape Naturaliste, to about twelve miles south, none was seen. In 1905, and several following years, in which I visited Albany, Rock Parrots were fairly common, and I often saw some, in small parties, not only about rocky places, but also round the low sandy beaches of the harbour, and at Emu Point, but it is many years now, since I saw any there. I can only attribute their apparent disappearance to domestic Cats gone wild.

Melopsittacus undulatus. Budgerygah (Shell-Parrots) were erratic visitors to the Broome Hill district, probably depending upon the rainfall, or scarcity of rainfall, further north. Numerous flocks were seen from Nov. 7, 1907, to February, 1908, the first being observed on a large sandplain a few miles east of Broome Hill. Some were breeding in the vicinity later in that month. April 23/12, a good many were seen to the east of Broome Hill. Mr. J. Higham told me that he had seen a small party on the

Williams River for a few days in August, 1917. I have no records of their occurrence further to the south-west.

Podargus strigoides brachypterus. Tawny Frogmouths were common about Broome Hill and the South-West generally, and were invariably known as "More-porks" by the residents. On February 19/06, when cutting "suckers" from dead trees, I saw a pair of these birds resting side by side in a thick mass of suckers, and, carefully approaching them, I caught one with my hands. On several occasions I saw Frogmouths hanging dead, having flown against the four-inch wire netting fences that were erected to keep out dogs, and got their heads jammed in a mesh of the netting. Nov. 4/06, found a fledgling bird, in very light grey downy plumage; July 13/08, saw a pair perched close together, and, as one of them was a tawny red color, shot it; it proved to be a female; Nov. 2/08, caught one of a pair of recently fledged young, in light grey plumage, and with reddish-hazel irides. Respecting the much-disputed call, or note, of this bird, in July, 1901, two men were sinking a well some distance inland from Point Cloates, and one day I saw a dead Frogmouth near their tent. Upon my enquiring as to why they had shot such a useful bird, one of them said that it used to visit the camp every night and disturb their sleep by its "Morepork," and he had shot it the previous night as it was uttering that call when perched on the windlass above the well shaft. I think this is very definite evidence. I skinned the bird at the camp, and showed the men that its gizzard was crammed full with large centipedes. (*Vide Mathews' "Birds of Australia," Vol. VII., p. 21*) The breeding season commences early in September, and goes on through October. Oct. 5/10, a female, that had apparently finished laying, was brought to me; Oct. 9/10, found a nest with two fresh eggs; Nov. 3/10, a recently fledged bird was seen; May 2/11, dissected a female bird that was very fat, and its gizzard filled with Centipedes, Beetles and Spiders; Nov. 29/11, saw recently fledged young near Lake Muir; Sept. 8/12, two eggs seen in nest; Sept. 26/12, found a small young bird, only a few days old, dead on a road; in its crop were some Grasshoppers and two Centipedes $3\frac{1}{2}$ and 4 inches in length, respectively; Oct. 25/12, saw two young in nest, about a week old; Feb. 7/19, saw a pair of adults, both in grey plumage, sitting side by side. On my visits to my old station at Broome Hill in 1916, 1919, and 1922, I was glad to see several of these useful birds in the vicinity. On several occasions I have come upon a pair of full-grown birds sleeping side by side on the ground, in daylight, generally near a large tree trunk, or under a bush. In the "Emu," Vol. X., p. 295, I described how these birds seem to compress their plumage, and assume an elongated rigid position when disturbed from their resting places in daylight.

Ægotheles cristata. Owlet-Nightjars were common about Broome Hill, but, being such unobtrusive little birds, were not often seen, but they are generally distributed in the South-West. One or two pairs always resided in holes in White Gum trees within a hundred yards of my house, and several times in the course of a day I would hear one violently scolding, from the mouth of its sleeping place, a stray Tree-creeper or Honey-eater, that had disturbed its slumbers, when looking for food. The breeding season seems to commence in August, as fledgling young were seen on several occasions in September. Sept. 27/08, I flushed a fledgling young bird, about 10 a.m. from some rushes and grass, and on two other occasions flushed an adult from a hollow log lying on the ground. Once I found one lying dead with a fractured skull at a wire fence, against which it had evidently flown. These birds continue to live in the same hole in a tree for many years. On March 6/22, when walking out with an old friend, who was then living a few miles east of Gnowangerup, he pointed out to me



Frogmouth in a York Gum-tree; find it!

A Grey Duck reared young in the broken spout on
left of tree (white gum), Wensleydale.

Photos. by Tom Carter, R.A.O.U.

a dead tree, and said that some years previously he had seen an Owlet-Nightjar come out of it; so we went to it, and upon striking the trunk one flew out.

Dacelo gigas. Laughing Kookaburras, originally introduced by birds liberated from the Perth Zoo, are now plentiful in most of the South-West districts, and are not altogether appreciated by the residents, owing to the partiality of some of the birds for young chickens and ducks. A pair of these Kingfishers were turned loose on the Warren River in 1909, and one of them was shot a few days afterwards in mistake for a "Squeaker" (*Strepera versicolor plumbea*). The surviving bird was seen in the locality for some time afterwards, and then it disappeared. In December 1911, about one hundred miles east of Warren River, I saw a solitary Kookaburra. My host informed me that it had been there for nearly a year, so it is probable that it was the bird from the Warren River, as no others had been seen anywhere near. In January, 1916, I saw a family party of these birds, and upon enquiry, my host told me that the original solitary bird had stayed for two or three years and then disappeared for a long time, and then (presumably the same bird) had returned with a mate and five young birds to its old haunt. These Kingfishers were very numerous on the Vasse River when I was there in April, 1919, and were eating young tame ducklings. I saw many of them in the forest country, east of Cape Naturaliste in January, 1922, but when staying in similar country a fortnight later, about ten miles to the south and west, none was seen. Apparently these birds had not reached the Broome Hill district up to March, 1922, as I saw none there.

Halcyon sanctus westralasianus. Western Sacred Kingfishers were common through the South-West area, and the following notes refer to Broome Hill district, where they seem to be partially migratory. First birds for the season, seen Oct. 2/05, Oct. 1/07, Sept. 23/08, Sept. 17/10, Oct. 7/12. That they are also late breeders may be inferred from the following:—Jan. 22/06, parent birds feeding recently fledged young at my stock tank; Feb. 22/06, caught a recently fledged young bird; Nov. 4/06, found a nest with four fresh eggs; Dec. 22/07, young birds still in nest; Dec. 2/08, young birds in nest; Dec. 11/10, shot a female with eggs of some size forming in ovaries; Dec. 13/10, young birds in nest; Dec. 24/10, fledged young seen. I have watched these birds at my house stock tank, drop into the water, and sometimes disappear completely for a moment or two, when catching Tadpoles or Water Beetles. The nesting holes in tree trunks vary from seven to thirty or more feet above the ground.

Halcyon pyrrhopygius. Red-backed Kingfishers occurred sparingly in the north of the area under consideration, January 10, 1903, Mr. B. W. Leake and myself found a nest containing five eggs in a hole excavated on the water pipe line alongside the railway near Kellerberin (Goldfields Railway).

Merops ornatus shortridgei. Western Bee-eaters were common in suitable localities through the South-West, and also at Broome Hill, in the summer. I have no notes of seeing any at the latter place between the end of February and early October, and believe that they go north in the winter months, as they were common then on the Gascoyne River and other more northerly districts. They breed commonly in December and January in open fields about Busselton, where they are known as "Gold-diggers," from their nesting-holes excavated on flat, open ground. I saw a pair breeding in such a situation near Cape Naturaliste, Jan. 2/22. The following are dates of first appearances of Bee-eaters at Broome Hill:—Oct. 17/07, Oct. 15/08, Oct. 25/10, Oct. 16/11, Oct. 7/12. These birds were most numerous and noisy during heat waves, and I append the following notes:—Jan. 29/06, many Bee-eaters about,

shade temperature 102° F.; Feb. 12-13/06, many Bee-eaters, temperature 98° F. both days; Dec. 3-6/06, many Bee-eaters, temperature from 100-105° F.; Feb. 21-23/07, Bee-eaters numerous, temperature from 104-109° F. On several occasions these birds were seen at the stock tank near the house diving right into the water and catching Wild Honey Bees (which were common, making their "hives" in hollow trees).

Cuculus pallidus occidentalis. Western Pallid Cuckoos were numerous at Broome Hill, the first stragglers making their appearance about the end of April, and the bulk following in May and June, but sometimes the first arrivals did not appear until July, as was the case in 1906, 1908, and 1912. By the middle of October most of the birds had gone again, but odd birds were noted calling in some years until the end of December, and on January 28/16, I saw a few at Lake Muir, the only other noted in that month being one seen on Jan. 1/08. I have no record of any being seen or heard in February or March. Before taking their departure, these Cuckoos seem to be very vociferous, and collect together a great deal. I have the following notes on this:—Oct. 10/07, Pallid Cuckoos very numerous and noisy, most went away about this date; Oct. 16/08, no Cuckoos heard for about a fortnight; Oct. 13/10, Cuckoos very noisy calling out, most of them went away soon after this date; Nov. 27/10, shot a fledged bird of this year; Dec. 6/11, fledged bird at Lake Muir; Dec. 29/11, one heard at Albany. The commonest "host" for the eggs of this Cuckoo seemed to be the Singing Honeyeater. Dec. 16/02, I saw a fledged young bird being fed by a White-naped Honeyeater, and on the same date another being fed by the Singing Honeyeater, both at Vasse River. These Cuckoos were common through the South-West area.

Cacomantis flabelliformis albani. Western Fan-tailed Cuckoos occurred regularly about Broome Hill, and through the South-West, but were not nearly so numerous as the Pallid Cuckoo. The following are dates of first arrivals noted at Broome Hill:—July 14/08, July 8/10, July 17/12. Sept. 1/10, I found an egg of this bird in a nest with two eggs of the Rock Field-Wren (*Calamanthus montanellus*) on a scrubby sand plain a few miles east of Broome Hill, and rather curiously, another egg was soon afterwards brought in to me from the same locality, also laid in a nest of the above bird. Many of these Cuckoos were seen at the mouth of the Warren River about March 27/19, and in January, 1922, several were seen about the 19th in the forest near Cape Naturaliste, but as none was observed before or after, it looked like a local migration.

Chalcites basalys wyndhami. Western Narrow-billed Bronze-Cuckoo.—The only specimen of this Cuckoo that came under my notice was brought in to me at Broome Hill, Oct. 14/11, by a neighbour's son, who often brought me anything he knew to be uncommon.

Lamprococcyx plagosus carteri. Western Bronze-Cuckoos were fairly common about Broome Hill and the South-West generally, at some times being seen for a few days in considerable numbers, as if migrating. About Dec. 15/07, they were very numerous for a short time in a recently cleared stubble field, and I saw a recently fledged young bird being fed by a Yellow-tailed Thornbill (*Geobasileus chrysorrhous*). Single birds were noted on Feb. 9/07 and Aug. 30/08. Oct. 31/08, a fresh egg was found in a nest of a Chestnut-tailed Thornbill (*G. uropygialis*); two were seen on Dec. 20/08, and one on Sept. 3/10. March 4/16, I saw several small parties, five to eight in number, feeding in scrub on the banks of the Margaret River, and about Dec. 29/21, several were seen in scrub near the beach at Busselton; one contained an egg

almost fully formed, but without any shell. An immature bird was seen at Lake Muir, Jan. 24/16.

Hirundo neoxena carteri. Western Welcome Swallows were generally distributed, and some could be seen at any time of the year, the only month in which no notes on them were made is March, but that does not imply that there were no Swallows. The main breeding month about Broome Hill was September, and on Sept. 5/10, a pair were building a nest under my verandah; Oct. 1/10, another nest was completed (elsewhere); No. 22/02, a nest with three eggs was noted on the Margaret River; fledged young were seen on Oct. 11/06 and Oct. 1/10; newly fledged young were seen in Albany, Jan. 20/09; and Swallows were flying about the streets in numbers. In April, Swallows congregated in immense numbers on the South-West coast. April 1/19, many were seen for miles on the telegraph wires near Busselton, and many were observed about Lake Muir in March, 1919, and April 4/19. Many were resting on the telephone wires between Augusta and Cape Leeuwin, and again about April 11 on the telephone wires at Cape Naturaliste; Dec. 23/21, hundreds of Welcome Swallows congregated on the Busselton jetty, and were there daily until Jan. 22/22, when they began to decrease in numbers. In all these cases fledged young predominated, and were being fed by parent birds.

Cheramœca leucosternum. White-backed Swallows were observed only at Broome Hill, and on two occasions, viz., April 3/06, several were flying high (a hot, sultry day, temperature 98°); Aug. 12/10, a few observed, flying very high. It would be easy to miss seeing these small birds, that usually fly high.

Hylochelidon nigricans. Tree-Martins were common in all districts. They laid their eggs (usually three in number) about Broome Hill in August and September, in holes in trees, on a handful or two of Gum or other leaves.

Hylochelidon ariel. Fairy-Martins were local in distribution, and not common. Some were seen in Katanning in Feb., 1919, and on Feb. 3/22. I saw several, in company with many Welcome Swallows, circling low down in a sandy hollow within fifty yards of the sea, near Cape Naturaliste, and busy catching some insects. Gould says he never saw this species near the coast. (Gould Handbook Aust. Birds, Vol. I., p. 113.)

Microeca fascians assimilis. Lesser Brown Flycatchers occurred at Broome Hill, and through the South-West, but were nowhere abundant. Being such plainly colored and unobtrusive little birds, they are easily overlooked. A pair of them take a liking to one certain place, and may be seen there year after year (or perhaps some of their progeny). I knew of certain tree stumps, or a row of fencing posts, where a pair of them could be seen at almost any date.

Petroica multicolor campbelli. Western Scarlet-breasted Robins were common through the whole of the South-West and around Broome Hill, but were most abundant in the dense coastal forests of Red Gum and Jarrah. Rather curiously, I have no breeding data respecting them.

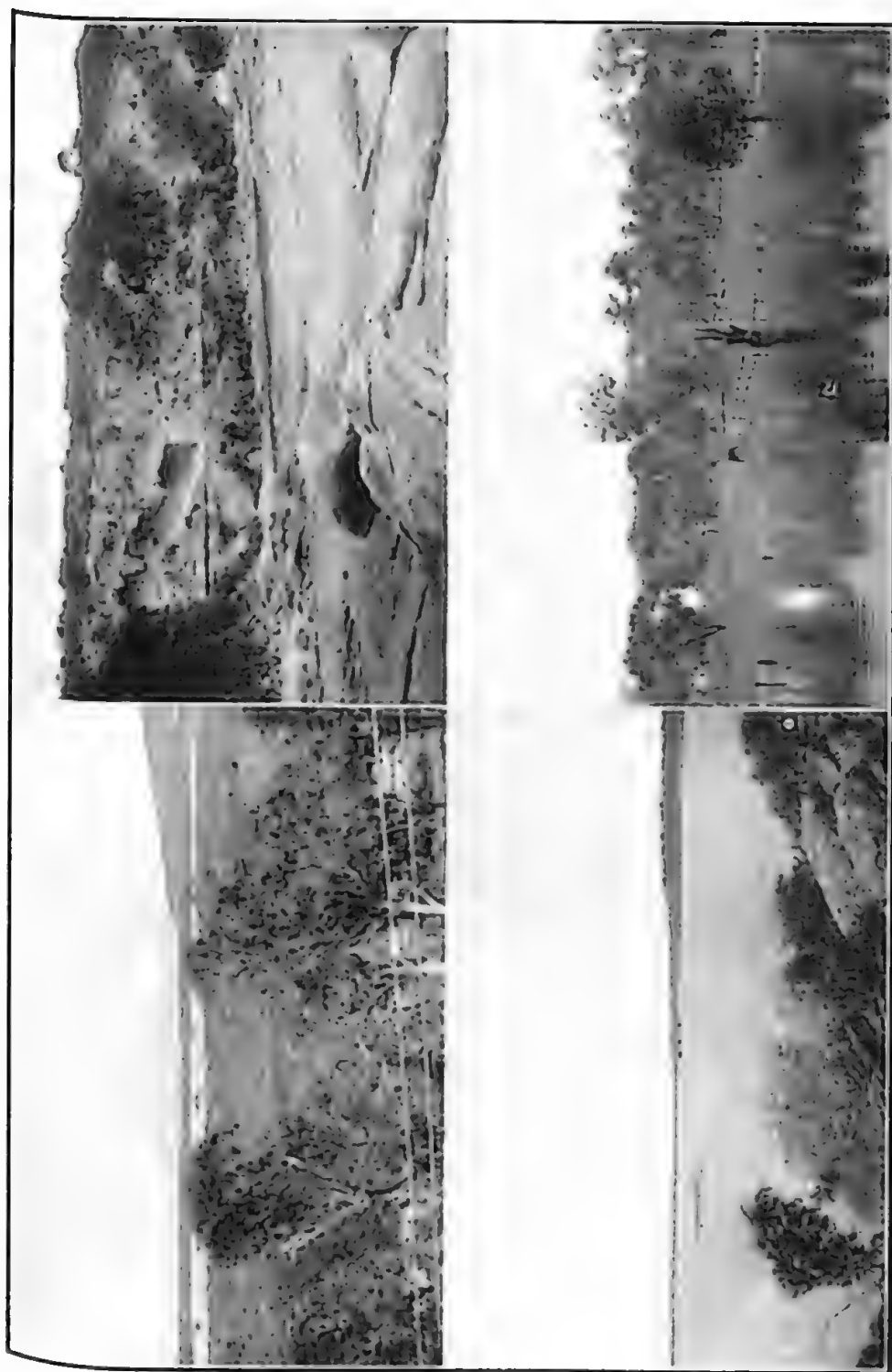
Petroica goodenovii ruficapillus. Western Red-capped Robins were not seen in the dense coastal forests of the South-West, but were not uncommon in the more open and lightly timbered country about Broome Hill, and were, I think, more numerous there than were *P. m. campbelli*. They were mostly seen in the winter months, from May to November, and the only note I have of them during summer was that I saw a full plumaged male on Feb. 3/19. July 26/08, found an almost completed nest; Sept. 30/08, found a nest beautifully made of green moss, sprinkled all over with silvery lichens, about five feet up, in a fork of a dead "Stinkwood" tree. It contained three fresh eggs. The nest much resembled the equally

pretty one of the British Chaffinch (*Fringilla coelebs*), which uses similar materials; July 29/10, the first of these birds seen this year which were numerous afterwards, and singing much in early August; the song is rather harsh and grating; Aug. 16/10, saw a male in immature plumage, that seemed to be breeding; May 28/11, the first one observed this year.

Melanodryas cucullata westralensis. Western Hooded Robins were rather common about Broome Hill, but not noticed much in the heavy forest country of the South-West. Sept. 5/08, found a nest with three eggs, built in a fork of a dead branch, laid on open ground. The nest was about four feet above the ground, and although it was rather conspicuous as a "lump" it could easily have been overlooked as a "nest" in such an open situation.

Rhipidura flabellifera preissi. Western Grey Fantails were generally distributed and common, and seem to be most plentiful in the winter months. Sept. 26/10, found one of the beautiful nests on a pendent branch of a she-oak, about eight feet above the ground on the bank of the Pallinup River. I was pulling down the end of the branch, in order to look into the nest, when the piece in my hand broke off; the branch sprang upwards, and, unfortunately, jerked out the three incubated eggs, which were, of course, broken. The nest was of a deep cup-shape and beautifully made of fine shreds of bark, she-oak needles, and fine grass, and bound round with spiders' webs.

Rhipidura leucophrys carteri. Western Black and White Fantails were common and generally plentiful in most districts, but I noticed that in some localities that I visited none were seen at the time, but their absence may have been only temporary; thus I have notes:—March, 1916, none were seen about Augusta or the Margaret River, but they were plentiful north and south of those places; Jan., 1922, none were seen during my three weeks' visit near Cape Naturaliste, but they were common at Busselton, 18 miles distant. In Mr. Ogilvie Grant's articles in "The Ibis," 1909, p. 685, "On a Collection of Birds from Western Australia," he quoted a field note of Mr. G. C. Shortridge, that the Black and White Fantail does not occur round Albany," to which I replied that it does occur there, but for some reason it seems to be rare in that locality, as on many different visits I have spent several months there, but saw only two or three of these birds during that time, and in March, 1910, I drove from Albany through the Stirling Ranges, and, although looking out for birds all the way, did not see a Black and White Fantail until reaching the Pallinup River, at a place about fifty miles north of Albany. I have a note that I saw one of these birds at Albany, Feb. 23/14. The following notes were made about Broome Hill:—Jan. 31/06, recently fledged young seen; Oct. 7/06, nest with three eggs; Dec. 23/06, nest with two eggs; Oct. 20/07, nest, three eggs; Nov. 2/08, nest, three eggs; Oct. 5/10, fledged young, a week old; Sept. 21/10, nest with three eggs on the top rail of a swinging floodgate across creek, the above eggs on hurdle duly hatched and the young were reared, and on Nov. 5/10, a second clutch of three eggs was laid in the old nest, but afterwards were forsaken; Dec. 31/10, a nest with one egg, and a young bird just hatching from another egg; the two young birds were full grown and left the above nest (Dec. 31) on Jan. 12/11, a period of twelve days in attaining their full growth. Oct. 25/10, three fledged young were perched side by side in a bush, and they were there on the same branch for three days, being fed by the parent birds, apparently without moving from it. The parent birds rested and slept on a bush a few feet away; Oct. 31/02, when rowing in a boat on the Vasse River, for about a mile, I examined six nests in bushes or on dead branches that overhung the water, all of which contained eggs or young; April



Lake Seepang, Albany, showing country near coast.
Lake Muir, showing island where Silver Gulls nest.

Coastal Cliffs, Cape Naturaliste.
The Stock Tank near the homestead, Wensleydale.

13/06, I watched a Black and White Fantail catching insects, or other food, that flew just above, or floated in the water, and several times saw the bird dive head first into the water, leaving only the tip of its tail momentarily visible above the surface.

Seisura inquieta westralensis. Western Restless Flycatchers were often seen at Broome Hill, but not many elsewhere, except at Busselton in Feb., 1919; Nov. 11/06, saw half-grown young in nest at Broome Hill.

Myiagra rubecula. Leaden Flycatchers are rare in the South-West, and Mathews' "Birds of Australia" describes only a North-West subspecies. I saw these birds at one locality only in the area under consideration.

Quoyornis georgiana warreni. White-breasted Shrike-Robins were first seen by me in Nov., 1902, under dense coastal scrub close to "Joey's Nose" (to the north of the mouth of Margaret River). The late Mr. Milligan ("The Emu," Vol. II., p. 73), who had visited the above locality about a year previously to myself, described this bird under the name of *Eopsaltria gularis*, as only being observed with the greatest difficulty. Since the above date, I have frequently met with it in various districts, and found it perhaps rather shy at first, but by keeping still, the birds soon gain confidence, and I have often watched them from a distance of a few yards. Several were seen in Feb., 1910, under the dense undergrowth alongside brooks at the Warren River, and again in March, 1919, I saw one or two about Augusta in March, 1916, and in Jan., 1922, I saw several at various swamps near Cape Naturaliste. In March, 1916, I also saw some at the Margaret River, but so far have never seen any far from the coast. Their alarm note may be described as "Whit-whit-churr-r."

Eopsaltria griseogularis. Western Yellow Robins were common everywhere in the whole South-West area. They have the habit of clinging sideways to the trunks of trees. Other species do so occasionally, but with these birds it is the normal position when resting, or watching. In Mathews' "Birds of Australia," Vol. VIII., p. 297, the word "branch" is used instead of trunk. I have referred to the copy of my note sent to him, and find that I wrote trunk. Probably my bad writing was responsible for the change of word. This bird is resident, and the main breeding month is September. The following are notes from Broome Hill:—Oct. 28/06, saw recently fledged young birds; Jan. 1/07, saw half-grown young in nest, probably a second brood; Sept. 12/07, noticed these birds building nest; Sept. 21/08, found a nest with two fresh eggs five feet above ground in a small dead "Jam" tree; Sept. 29/08, found another nest with two eggs in a Stinkwood bush; the nest was covered outside with strips of dry bark hanging perpendicularly, and so are very protective in coloring, especially in small trees like Stinkwood; March, 1916 and 1921, I noted these birds as being unusually abundant about Broome Hill and Gnowangerup; Jan., 1922, they were common in the Red Gum and Jarrah forest near Cape Naturaliste, and I noticed that they uttered notes almost exactly like those of the Golden-breasted Whistler (*Pachycephala pectoralis*) which end with a sharp "whit."

Falcunculus leucogaster. Western (White-bellied) Shrike-Tits were fairly common in the Broome Hill district, and east of there in the White Gum and "Jam" trees, but I have no notes of seeing them further west. Sept. 20/10, shot a fledged young bird; Feb., 1919, noticed as being unusually plentiful; March 4/19, adult birds were feeding recently fledged young.

Oreoica cristata westralensis. Western Crested Bell-Birds were common round Broome Hill, but did not occur in the dense forests to the west. Sept. 17/05, shot a female, evidently breeding; Jan. 3/06, young birds still in nest, no doubt a second brood; Nov. 17/07,

two fresh eggs in nest, with five large hairy caterpillars; July 31/08, nest with four eggs in some White Gum suckers; Nov. 25/08, nest found with two fresh eggs; Oct. 8/10, nest with three incubated eggs, about four feet up in a hollow stump of a she-oak (*Casuarina*) that stood on open ground; three hairy caterpillars were with the eggs; Nov. 18/10, a nest with two fresh eggs, about eight feet up in the fork of a "Jam" tree; Aug. 29/12, found a nest with three eggs, and on Sept. 1 found that the young birds had hatched out; Sept. 25/12, found a nest with two fresh eggs; Feb.-March, 1919, noticed these birds were scarce round Broome Hill; March 9/22, when on the sandplain country to the east of Gnowangerup, Bell-birds were common, in full song and breeding; no doubt the cause of their laying out of season was a heavy thunder storm with rain, that had recently passed over the district, but it was very interesting to find that the birds were laying, when also moulting, as were two that I obtained when singing.

***Pachycephala pectoralis*.** Golden-breasted Whistlers were very common all through the forests of the South-West, but were less in numbers about Broome Hill and the more open eastern localities. Rather curiously, I have no notes of their breeding, although they were always resident.

***Pachycephala rufiventris*.** Rufous-breasted Whistlers occurred through the South-West generally, but were not so common as the preceding species. Oct. 14/06, found a nest with three fresh eggs at Broome Hill.

***Pachycephala inornata gilberti*.** Gilbert Whistlers were fairly common about Broome Hill, and a few miles to the north and south, but were never observed south of Cranbrook, which is 25 miles south of Broome Hill. Aug. 18/10, found a nest in a Stinkwood tree about five feet up; the nest was bulky and made of large pieces of bark and small twigs, with pieces of sheep's wool interwoven; it was lined with fine grass and fibre, and contained three eggs, somewhat incubated; Sept. 23/10, found a nest about twenty feet up in the fork of a She-oak tree; the birds apparently deserted it, as no eggs were laid. During subsequent visits to Broome Hill in February and March, 1919, and the same months in 1921, none of these birds was observed. They mostly feed in the bushy tops of smaller trees as She-oak, Jam, and Stinkwood, and the male bird has a peculiar loud note like "Poo-ee, poo-ee," followed by a rather harsh "Chut-chut." I often watched some of them feeding in the Jam trees in the fowl run at Broome Hill.

***Colluricincla rufiventris*.** Western Shrike-Thrushes were generally distributed, but I think were more numerous about Broome Hill than in the denser wooded districts. They are resident. Oct. 28/05, saw some recently fledged young; Nov. 23/06, found a nest with three fresh eggs; Dec. 2/06, saw fledged young; Oct. 21/07, nest with two fresh eggs, with the male bird on them, about ten feet above the ground, in the fork of a Jam tree; Nov. 2/07, nest with two fresh eggs; Dec. 22/07, fledged young being fed by parents; Oct. 10/08, fully fledged young seen; Oct. 21/10, when cutting down a large Jam tree, in the small upper twigs of which was an old nest of White-browed Babblers, about 25 feet above the ground, I noticed a Shrike-Thrush was moving about in the upper branches, and uttering plaintive notes; when the tree fell, we found a nest of Shrike-Thrushes built inside the old Babblers' nest, but the three fresh eggs were broken with the fall of the tree; Dec. 15/10, saw a female Thrush feeding fledged young; June 28/11, found a Shrike-Thrush's nest completed, and built inside an old nest of White-browed Babblers, about ten feet above the ground, in a Stinkwood tree; Nov. 2/12, fledged young observed; from the above notes it seems that two broods are sometimes reared in the nesting season

that extends from June to end of November; Feb. 27/22, at Broome Hill I saw a Buff-breasted Shrike-Thrush feeding a fledged young bird, on the ground. Naturally thinking it was an immature Shrike-Thrush, and would make an interesting specimen, I shot it, but upon picking it up was amazed to find that it was a fledgling Rufous-breasted Whistler. The bird that had been feeding it had flown into a neighbouring tree, where it was perched a few yards from me, with fluttering wings, and uttering low piping notes of distress. When I approached, it flew into another Gum tree a short distance away, and was joined by another Thrush, evidently its mate; they perched close together with ruffled feathers and quivering wings, and both uttered mournful notes of distress. As I followed, they kept flying further away, decoying me from where the young bird had been. A careful search failed to reveal any nest, or other young birds.

Pteropodocys maxima neglecta. Western Ground Cuckoo-Shrikes were generally rather common about Broome Hill, and within a radius of about 30 miles from there, but were not seen in heavy forest country. They move about in small parties; the largest of those I saw in that district was twelve, on a sandplain to the east of Cranbrook, on March 16/10. In June, 1906, a party of seven used to fly regularly over my house about sundown, apparently going to a roosting place. Sometimes several weeks, or even months, would pass, without any being seen. They are extremely elegant birds in appearance, either when walking on the ground, which they do to a great extent, or when flying. They undoubtedly extended their range, or became much more numerous, a few years after I settled at Broome Hill, as my attention was called to them in several outlying localities by farmers, who had not seen them before, and wanted to know what birds they were. The breeding season is in September, two or three eggs being the clutch. The nests are very flat, and the nesting material very scanty, and composed of some roots or twigs and a little dry grass or fibre, with which is mixed in a casual sort of way some moss and usually some sheep's wool. Sept. 21/10, found a nest containing two young birds, one much larger than the other, probably about a week old. The nest was laid on the top of a flat forked branch of a York Gum tree, without being attached to it in any way, and as I stood immediately below it, was hardly noticeable. I had been watching the adult birds for some time carrying food in their beaks; until I traced them to the nest, which was about thirty feet above the ground. While I was looking through my binoculars to locate the nest, I became aware that what had seemed to be the end of a dead limb was one of the parent birds perched in a rigid upright position with its beak pointing straight upwards, and a few feet above the nest. When I reached the nest, and was examining it and the contents, both the adult birds fluttered close round me, with ruffled feathers. The young birds were still in the nest on Oct. 5. Not many of these birds were observed in 1911, and fewer still in 1912, but a pair of them had a nest in one of my paddocks, and on Sept. 12 it contained two eggs; Nov. 3/17, a recently fledged young bird was seen. In Feb., 1919, several small parties were seen about Broome Hill; I shot one out of a party of five, and the remaining birds made a great fuss about it, as it lay on the ground, and showed great concern; March 9/22, several were seen about twelve miles east of Gnowan-gerup.

Coracina novæ-hollandiæ westralensis. Western Black-faced Cuckoo-Shrikes (generally known as Blue Pigeons), were common through the whole South-West corner. They also make small flat nests laid on the fork of a horizontal branch. Nov. 4/06, found a nest at Broome Hill containing two incubated eggs; Feb. 16/16, saw two recently fledged young near Busselton; I noticed these

birds as being unusually common about Broome Hill and Lake Muir in Feb., 1916, and round Busselton in 1919.

Campophaga tricolor.* White-shouldered Caterpillar-eaters were fairly common about Broome Hill from mid-August to the end of December, but were not observed in the heavy forest areas further west. First appearances were noted on Aug. 15/07, Sept. 7/08, Sept. 1/10. Three were shot on Sept. 21/10 for breeding data, but no evidence was found of breeding then, but they had eggs in mid-October that year, and fledged young were seen on Nov. 12. On Feb. 17/05, I shot an adult bird at Albany. Dec. 17/10, a full plumaged male seen at Broome Hill.

Cinclosoma castanotum. Chestnut-backed Ground Birds were not uncommon in rough timbered country about Broome Hill, and the scrubby sandplains east of there, but not seen elsewhere, although they can be easily overlooked from their seclusive habits and keeping under the shelter of thick scrub. They usually trust to their running powers to escape intrusion, but at other times will squat closely and almost allow themselves to be trodden on. I have also occasionally seen them rise on the wing quite wildly. A few pairs used to breed on a strip of rough, rocky and scrubby country on the north boundary of my Broome Hill station. When a bird does rise from the ground, its wings make a distinct "whirr." Oct. 19/08, saw a pair of half-grown young in nest; June 10/10, shot a fully fledged immature bird on quite open ground; Dec. 23/06, shot an adult male that was moulting. In early October a nest containing two eggs was found under a bush quite close to the edge of a by-road going through thick scrub.

Drymodes brunneopygia pallida. Western Scrub-Robins were only observed by me in the scrubby sandplains with large masses of Marlock and other dwarf timber that extend to the east of Broome Hill. They were not abundant, but can easily be overlooked on account of their very unobtrusive habits. On July 14/10, an egg was brought in to me by a very observant "bushman," who had obtained many rare specimens for me. There was only one egg in the nest, which was on the ground in a fairly open patch of silver grass; on Nov. 6/10, two nests were found in the same locality to the east of Broome Hill, each containing an almost full-grown nestling. The female bird at one nest showed great anxiety, and came so close that she could have been killed by my companion with a stick he held in his hand. Feb. 13/19, I shot a male in full moult near Gnowangerup. It came close up as I was resting in thick scrub, and evinced curiosity as to what I might be; in March, 1922, I saw another of these birds in the same locality. As both these birds were moving about and feeding in the dusk of evening, it seemed to me that they must be crepuscular in their habits.

Hylacola pyrrhopygia whitlocki. Western Ground-Wrens also occurred in the same kind of scrubby ground country east of Broome Hill, as did the Scrub-Robin *Drymodes*, but the Ground-Wrens seemed to prefer scrub growing on rough and stony ground, were exceedingly quick in their movements, and did not show the curiosity of *Drymodes*. The tails are carried erect, and they reminded me of the Dirk Hartog Grass-Wren (*Diaphorillas*). In Feb., 1919, I saw many of them not far from Gnowangerup; they were moulting. In March, 1922, many were seen a few miles farther east. The male birds utter their song from the top of a bush, and when approached, drop to the ground in the same way as a Field-Wren.

*Mathews' sub-sp. *dundasi* seems to refer to the interior districts only.



Unusual site for Nest of a Flame-breasted Robin; female on nest; inset, bird near nest.
Photo. by Miss J. A. Fletcher, R.A.O.U.

Pomatostomus superciliosus ashbyi. This subspecies of the White-browed Babbler was generally distributed through the South-West area, but was more numerous about Broome Hill than in the denser timbered district, and was not observed much on the coast. March 31/19, I saw a family party on the Warren River, about fifteen miles from the coast, and a specimen taken seemed to be a typical *ashbyi*. Busselton is the only district where I have seen any on the coast. About Broome Hill they bred regularly from August to December, inclusive, and reared second broods. Their bulky domed nests were generally built in the bushy tops of Jam or Sheoak trees, and were made of stout twigs with linings of grass and fibre, and often contained some sheep's wool and feathers, especially parrots' feathers of red, yellow, green and blue. The usual clutch of eggs was three. Nests containing fresh eggs were found on Oct. 7/06, Oct. 20/07, Oct. 11/08, Nov. 2/08, Dec. 20/08, Dec. 15/10, and Aug. 21/12, which, I think, shows that second layings were usual; the following notes confirm it:—Nests with incubated eggs were noted Dec. 23/06, Aug. 13/08, Oct. 11/08, and Nov. 5/10; a nest was found containing small young birds; recently fledged young were noted on Sept. 9/06 and Oct. 2/07. I have seen these Babblers pull to pieces and destroy nests of small birds, and on one occasion (Nov. 2/08) saw them treat a Red Wattle-bird's (*Anthochaera carunculata*) nest that way. The eggs were destroyed, and, I think, the contents were eaten, anyway, I watched the Babblers peck and break them, after they had fallen to the ground.

Acrocephalus australis gouldi. Long-billed Reed-Warblers were not observed close to Broome Hill, as there were no suitable places for them, but were common through the South-West on all large sheets of water where tall rushes grew, as about Lake Seepings, near Albany, Lake Matilda, east of Cranbrook, and especially at the two large freshwater lakes near Lake Muir, viz., Tordit-gurru and Byenup, which are practically one sheet of water, five miles in length, and at parts one mile wide. The rushes generally were alive with these birds, which kept up a chorus of cheerful songs as long as the sun shone. When the sky was overcast they kept silent. They seldom came to the tops of the reeds, but kept low down in them, and on seeing anyone uttered an alarm note of Chat-chat, and were never seen by me away from above the water. As there were no boats at the above two places, and it was impossible to either wade or swim, I have no breeding data. In March, 1919, Mr. J. Higham and myself found these birds in full moult, and in great numbers, at another rushy swamp near the north end of Lake Muir.

(To be concluded.)

Camera Craft

Unusual Site for the Nest of Flame-breasted Robins—The Steppes (Tas.).—The accompanying photograph of the nest of a Flame-breasted Robin (*Petroica phoenicea*), is interesting from its rather uncommon position, that is judging from my experience. The little home was made on a stone beneath the fallen trunk of a tree, and on the north-eastern side, where it would receive all the possible sunshine and be protected from the snowy blasts of the south. Several times during the few weeks I stayed at the Steppes the country was white with a heavy fall of snow. What a vivid touch of colour

these Robins made then! I found three nests altogether in a similar position. Two owners of these reared their brood, but the little mites in the photo were taken. A ferret, evidently dropped by some rabbit, was picked up near the Robin's nest, and when I looked for the baby Robins, I found an empty home.—Miss J. A. FLETCHER, R.A.O.U., "Lyeltya," Eaglehawk Neck, Tasmania.

* * *

The Brolga. — It is good news that, in Victoria, at least, the Brolga, or Native Companion (*Antigone rubicunda*), is likely to enjoy full protection, under the Game Laws. It is one of our finest birds, a true Australian; but it has been wantonly shot for "sport," or ruthlessly destroyed as a "pest," until, in Victoria, it has become a rare bird, while its numbers have greatly decreased in some of its haunts in other States. During a little journey in Riverina (Jerilderie and neighbouring districts), some years ago, I saw a few Brolgas near a wheatfield. They were extremely shy, and I learned that, in these parts, the species was regarded with disfavour. No fewer than 400 Brolgas had been killed, by poison, in one locality. How can any species be preserved for posterity if such deplorable massacres often occur? The young bird shown in the photograph has already been mentioned in *The Emu* (vide vol. xvi., pp. 20-1). It had been captured by some children, and reared as a pet on the farm. Shortly after my visit, I believe, it was liberated near a swamp, where Brolgas sometimes nest.—CHARLES BARRETT, C.M.Z.S., Melbourne, Vic.

* * *

Bird Caught in Spider's Web.—In 1914 you (Mr. D. Le Souef, late Gen. Sec., R.A.O.U.) wrote me about birds caught in spiders' webs. I had seen one caught, and promised if I ever saw such a thing again I would photograph it. Now, for the first time since then, I have seen it again, and tried very hard to get good photos., but I am afraid they are not much good. It was most difficult to get a good photo., as the web was built from the roof of our house to a lemon tree, and we had to climb on boxes and a tank to get it; even then could not get close, and in the photo. the web does not show at all. However, it may be of some interest to you. I also tried to take a photo. of the spider, but could not manage to get a decent one; however, will send the photo. along also. The spider I have put in spirits, and am also sending to you. The web was very sticky, and we found it very hard to liberate the little bird, which was very much alive and kicking. I think the bird was a sort of Finch—greeny yellow, with a blunt beak, about as big as a Swallow. It flew away quite well after we had pulled its tail out in our efforts to get the web off. It had been there nearly all day. The spider was black when I put it in the bottle, but I notice it has gone brown now.—Mrs. INNIS HUMPHREY, Poonah, Q.



Above, Bird hanging by Spider's Web.
Below, Spider that made the Web.

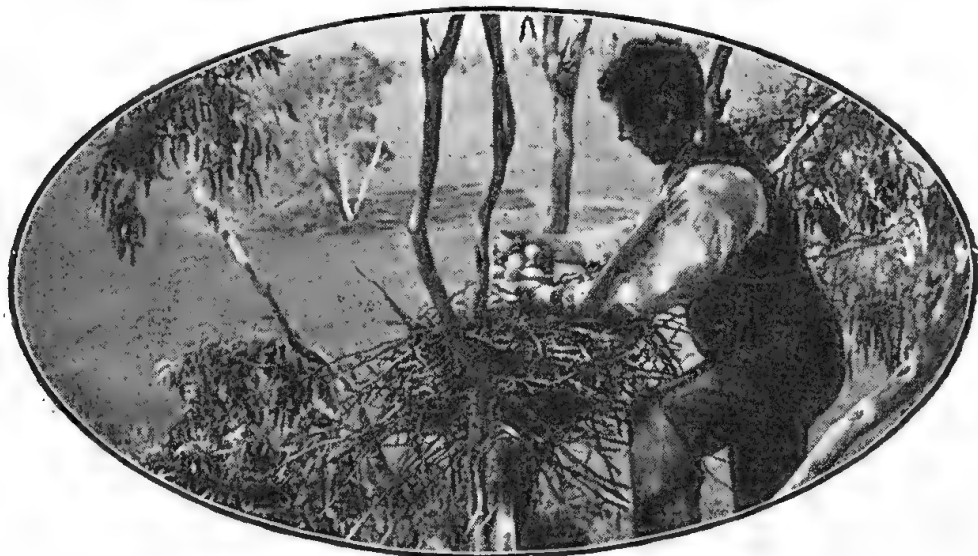
Photos. by Mrs. Humphrey, Poopoonah, Q.



Young Native Companion or Australian Crane.

Photo. by C. L. Barrett, C.M.Z.S.

Unusual Nesting Site of a Black Duck.—Mr. G. W. Broughton, of Berrigan, New South Wales, reports having found the nest of a Black Duck in a very unusual position. It was



placed in a nest of either a Crow or a Hawk, some 50 feet from the ground, close to a small pond. The young were safely hatched, and are now, with the parents, in the water. The nest contained 9 eggs, and was lined with a deep layer of down.

Stray Feathers

Bush-Fires in National Park, Sydney.—National Park has seriously suffered last season through widespread bush-fires and will take a long time to recover. The birds most affected were the ground-living birds, who have been deprived of shelter, as well as food, and, no doubt, many must have perished. Another regrettable fact due to the bush-fires is the removal of much top-soil containing seeds by the rain, since the water, owing to the destruction of small plants and shrubs, found no resistance in sweeping the soil off. Naturally this must react on bird life. It has also caused some changes in the habitats of some birds, whose food supply was destroyed, and which, therefore, had to look for other localities not affected by the fires. Satinbirds still form the main interest in my bird studies. Recently I have been able to show Dr. Ritter, from California, a Satinbird at work at his bower. The summer visitors have gradually arrived one after another, but some are still missing; on the other hand, I have noted a few not usually found in the Park.—E. NUBLING, R.A.O.U., Sydney.

The Cuckoo Problem.—With Mr. Stuart Dove, I can also say that the domed nest offers no trouble to the Cuckoo. In several instances I have found a Fan-tailed Cuckoo (*Cacomantis flabelliformis*) in the nest of the White-browed Scrub-Wren (*Sericornis frontalis*), and once in that of the White-

throated Warbler (*Gerygone albigularis*). In the latter case, I was lucky enough to see the Cuckoo with its own egg in its bill place the egg in the nest. On going to the nest at once, I found only one egg there, that of the Cuckoo. Returning some days later, I found the Warbler had laid a full clutch of three eggs. When the young hatched out, the Cuckoo soon got rid of its nest mates. Later, growing too big for the tiny nest, it burst its way out with no trouble, but left the beautiful little nest in rather a bad state. Now the *Gerygone* makes a close woven nest, and when a young Cuckoo can tear its way out of such a nest it can escape from any nest made by small birds. With the Scrub-Wren, also, the Cuckoo had no difficulty in making an exit.—J. F. H. GOGERLEY, R.A.O.U., Ellerslie, Wallis Lake.

* * *

The Pipit in Elevated Regions.—Our modest-plumaged little Pipit (*Anthus australis*) appears quite indifferent to altitude, as it is found from the coast at sea level to the mountain plateaux, and seems equally at home everywhere. The New Zealand species (*Anthus nova-sealandiae*), closely allied to ours, is equally hardy. When near the top of McKinnon's Pass, on the overland track from Lake Te Anau to Milford Sound, I observed one of these little travellers on the cold, wet, spongy soil, amid patches of snow still unmelted, although the season was midsummer. Dr. Lutz, the American naturalist, while insect-collecting on the mountains of Colorado, U.S.A., noted Pipits breeding in the Arctic-alpine zone, at 11,000 feet, where snow lies for the greater part, or all, the year. He says that they, together with the Whitetailed Ptarmigan and Brown-capped Rosy-Finches, breed nowhere else, so the Pipit family is evidently a hardy one all the world over.—H. STUART DOVE, F.Z.S., W. Devonport, Tas., 3/12/23.

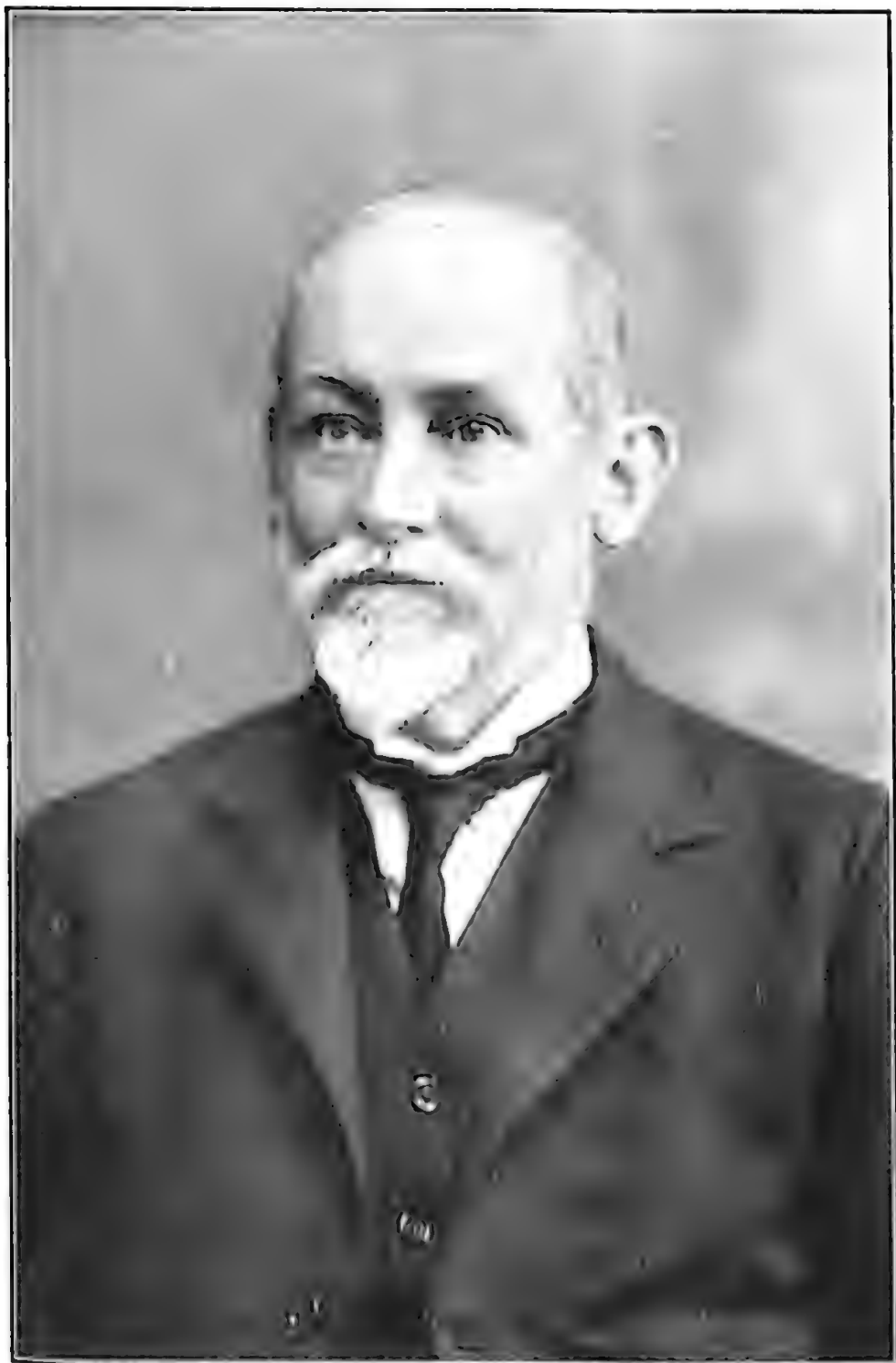
Obituary.

W. H. DUDLEY LE SOUEF, C.M.Z.S., C.F.A.O.U.

The R.A.O.U. celebrated its 21st anniversary, or attained its "majority," at the Adelaide meeting last year. Since, there has passed away one of its prominent founders.

Not every person lives to see the fulfilment of his labours. Yet, the late Mr. W. H. D. Le Souef did so. The achievement was the greater because the R.A.O.U. is not a parochial, or even a State affair, but an Australasian association of persons interested in the birds of a wide area of the earth's surface. The success of the movement was largely due to Mr. Le Souef's energy, tactfulness, and withal, never-failing courtesy. Fortunately, from the beginning he has been in office—twice for long periods as Hon. Secretary—and for two years he filled the important office of President.

In his official capacity as Director of the Zoological Gardens, Melbourne, he went much abroad, and it goes without saying



The Late W. H. D. Le Souef, C.M.Z.S., C.F.A.O.U., &c.
Sometime President and General Hon. Sec. R.A.O.U.

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that on such occasions he largely advertised the Ornithological Union. Mr. Le Souef was a born collector. The fine collection of live birds, mammals, etc., at the gardens, stated to have "few rivals in other countries," bears eloquent testimony to the fact. Yet he did not neglect the other activities of the Union, whether scientific, field or photographic—nothing was a trouble. "Don't you worry," was often a favourite expression of his. Good advice! One who has faith in anything never worries. His ever cheery optimism was most refreshing.

It is well to hear what others say of our late member. The following is from *The Argus*, 7/9/23:—

LE SOUEF.—On the 6th September, 1923, at his residence, Zoological Gardens, W. H. Dudley, loved husband of Edith E. Le Souef, in his 67th year.

1 Thess. iv., 14.

"Mr. Le Souef, who was aged 66 years, was born at Elwood (Victoria). He received the greater part of his education at the Crediton Grammar School (Devonshire, England), and in 1902 succeeded his father, the late Mr. Albert Le Souef, as director of the Melbourne Zoological Gardens. For many years previously he had held the position of assistant director. He made practically a life-long study of the birds and animals of Australia, and was probably more conversant than any other authority with the general fauna of the Commonwealth. He travelled extensively in Australia, photographing and observing the habits of birds and animals, often in unexplored country. It is said that he could distinguish the note of practically every bird in the Australian bush, and those who accompanied him on his journeys found him an interesting and delightful companion. To represent the Victorian Royal Zoological and Acclimatisation Society at scientific congresses, and to obtain animals for the Zoological Gardens, Mr. Le Souef visited many parts of the globe, and was well known in zoological circles throughout the world. He was responsible for many of the improvements which have been made to the Zoological Gardens in the last 20 years. He was held in high esteem by the staff of the gardens.

"Several years ago Mr. Le Souef was way-laid and attacked by two men in the vicinity of the gardens when returning from the city with the wages of the staff. He was hit several times with a heavy instrument, and it is believed that he never fully recovered from the severe injuries which he sustained then. He was a corresponding member of the Victorian, London, and New York Zoological societies, and was also a member of the British Ornithologists' Union, and the council of the Royal Australasian Ornithologists' Union, being at one time president of that body. He was the author of "Wild Life in Australia" (1907), and collaborated with Mr. A. H. Lucas, M.A., B.Sc., in the production of "The Animals of Australia" and "The Birds of Australia" (1911). Mr. Le Souef leaves a widow and six children. One of his brothers, Mr. E. Le Souef, is in charge of the Perth Zoological Gardens, and another brother, Mr. S. Le Souef, occupies a similar position in Sydney."

The Council of the Royal Zoological and Acclimatization Society, placed on record "its high appreciation of the very valuable services rendered by the late director, Mr. W. H. D. Le Souef, through a long service of years, and expresses profound regret at the loss of a valued officer, whose efforts have

secured the splendid collection of exhibits now on view at the Zoological Gardens."

From his fund of experimental knowledge, Mr. Le Souef was an entertaining lecturer, and his subject was always backed by numerous original and artistic illustrations (photo-slides). The writer well remembers Mr. Le Souef's last lecture. It was at Adelaide, before the local Field Naturalists' Club, November, 1920, when he held his audience for two hours, without interruption. Mr. Le Souef was a man of many parts. At the graveside of a deceased naturalist, he could, with composure, assist in the burial service, or if, in the back-blocks, in the absence of a clergyman, on Sunday evening he could lead in family devotions. At life's "sunset" with him it was—

"Nothing more to doubt or dare,
Nothing more to give or keep;
Say for me the children's prayer—
'Now I lay me down to sleep.'"

* * *

COLONEL T. M. EVANS, V.D.

After an illness lasting only a few weeks Colonel T. M. Evans, V.D., of New Town, died in Stowell Hospital, on November 28. He had been living in retirement for some years in his fine old residence, Flint House, near Bay-road. He was well known throughout the State, and had a wide circle of friends. He had been closely associated with matters appertaining to the militia, was a member of the Council of the R.A.O.U., was a first-class Royal tennis player and rifle shot. He was in the best of health right up to his last illness, which came with unexpected suddenness.

Colonel Evans was born in Hobart on August 6, 1844. When the news of the Great War came through, Colonel Evans had the distinction of being the first man in Tasmania to volunteer for active service, but on account of his age it was not possible for him to leave the State. He filled the position of censor for Tasmania.

He was an enthusiastic nature lover, being a member of the council of the Royal Australasian Ornithologists' Union, and associated himself with matters of historical interest connected with Tasmania, accumulating in this respect a large number of old papers and records of the settlement of the colony.

When Sir William Ellison Macartney was Governor of Tasmania, Colonel Evans was appointed A.D.C. —Adapted from *The Mercury*.

* * *

The date of publication was January 11th, 1924.

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Pressure on space caused the holding over of much matter.

NATIONAL MUSEUM MELBOURNE



The Long-lost Night-parrot (*Geopsittacus occidentalis*).

For letterpress see pages 262-264.

From a Painting by Neville W. Cayley, M.B.O.U.

The Emu

Official Organ of the Royal Australasian Ornithologists' Union

"Birds of a Feather."

VOL. XXIII.]

1st APRIL, 1924.

[PART 4

Description of Some New Nests and Eggs

By H. L. WHITE, C.F.A.O.U., Belltrees, Scone, N.S.W.

Amytornis purnelli. Dark Grass-wren.—*Nest (Type)*, a comparatively large and half-domed structure, very loosely composed of fine, dried, soft grasses, lined with partly decayed and very soft weather-worn grasses. Height over all $5\frac{1}{2}$ inches, width $5\frac{1}{4}$ inches, opening $2\frac{1}{2}$ inches high by $2\frac{1}{2}$ inches across; depth from front to back (inside) 2 inches. Built near the ground in a clump of *Triodia* or Porcupine-grass. *Eggs (Types)*, clutch 2; swollen ovals in shape; surface of shell fine, and rather glossy. Ground colour pale pinkish-white, well marked all over with minute specks and blotches of light to dark reddish-brown, the markings becoming much larger and crowded at the larger end, and forming an irregular cap. The pair measure:—A, .83 x .62, B, .83 x .62 inches. (*Co-types*), clutch 2; rounded ovals in shape; surface of shell fine and slightly glossy. Ground colour white, possessing a very faint pinkish tinge, spotted and blotched with light to dark reddish-brown, paler umber and lilac; becoming confluent at the larger end, and forming a well defined cap. The pair measures:—A .77 x .58, B .77 x .58 inches. Of those received, no two clutches are alike. Taken by Mr. F. Lawson Whitlock at the entrance to the Finke Gorge, near Hermannsburg, Central Australia, on (*types*) 15th September, 1923, and (*Co-types*) 13th September, 1923.

Although the following nests and eggs have already been described, it may be of interest to mention those collected by Mr. F. Whitlock, near Hermannsburg, Central Australia, during August and September, 1923.

Amytornis modesta. Thick-billed Grass-wren.—*Nest* large, very loosely constructed, and half-domed, with a large opening on the side, composed of dead well bleached grasses, strips of soft bark, *etc.*; lined with very soft, decayed grasses. Height over all $6\frac{1}{2}$ inches, with $4\frac{3}{4}$ inches, opening $2\frac{1}{2}$ inches high, by $2\frac{1}{4}$ inches across, depth from front to back (inside) 2 inches. Nest placed nearly on the ground, and sheltered by Cane-grass (*Spinifer paradoxus*). *Eggs.* Clutch 2; long ovals in shape; surface of shell rather fine and slightly glossy. Ground colour of a pale reddish-white, well spotted and blotched all over, and particularly at the larger end, where is a well defined cap of light to dark reddish-brown. The pair measures—A .90 x .58, B .87 x .58 inches. Another clutch contains 3 eggs which measure:—A .83 x .61, B .80 x .62, C .83 x .60; and one contains four eggs which measure:—A .83 x .61, B .83 x .61, C .83 x .58, D .83 x .58. Two eggs (A and B) of this clutch are heavily spotted and blotched with light to dark reddish-brown and purplish-grey, while specimens C and D are marked all over with very minute specks of reddish-brown. Apparently this is a "combination clutch." One pair was fresh, and the other stale. Probably an "*Amytornis* marriage with a deceased wife's sister." Collected on 3rd September, 1923. Nest a fully domed structure, was placed in the middle of a dense prickly bush. For previous description of nest and eggs, *vide North's "Nests and Eggs of Birds found breeding in Australia and Tasmania," vol. I., p. 250, and Mathews' "Birds of Australia," vol. X., p. 184.* When a nest of this species is placed upon its back, it certainly resembles an open cup-shaped structure—instead of a perpendicular half-domed one, such as it appears when in its natural position. Through this an error has accidentally crept into page 175 of *vol. X. of Mathews' "Birds of Australia,"* where my notes are quoted as describing the nest of *Amytornis textilis* as being open and cup-shaped.

Stipiturus ruficeps. Rufous-crowned Emu-wren.—*Nest* a small, neat, domed structure, composed of very fine dead, soft, weather-worn grasses; lined with soft wool-like vegetable substance; placed in a *Triodia* clump. Height over all four inches by $2\frac{3}{4}$ inches across, by $2\frac{1}{2}$ inches from front to back. Inside measurement from front to back, $1\frac{3}{4}$ inches. *Eggs;* clutch 2; very rounded ovals in shape; surface of shell fine and smooth, but almost entirely devoid of gloss. Ground colour white, spotted and speckled with pale to darker rusty and reddish-brown, with an irregular zone at the larger end. The pair measures:—A .57 x .44, B .58 x .45 inches; smaller and paler than those collected at North-West Cape, Western Australia, on 13th October, 1916. Collected on 18th September, 1923. For previous description of nest and eggs, *vide "Emu," vol. XVII., p. 39, and Mathews' "Birds of Australia," vol. X., p. 147.*

NATIONAL MUSEUM WASHINGTON



A Group of Palms, James' Ranges, C.A.

Photo. by Sir Baldwin Spencer, F.R.S.

Notes on Eggs Collected in Central Australia by F. L. Whitlock, R.A.O.U., 1923.

By H. L. WHITE, C.F.A.O.U., Etc., Belltrees, N.S.W.

Wedge-tailed Eagle (*Uroaëtus audax*).—Clutch, 2 eggs, taken at the Macdonnell Ranges, 3rd and 23rd August, 1923. The first egg is a beautiful specimen, being heavily spotted and blotched; the second egg is very pale, and almost devoid of markings. The great difference in the two eggs is very striking, and, coming from Central Australia, the clutch is of special interest. The eggs are smaller than usual; one measures 2.87 x 2.15 inches.

Whistling Eagle (*Haliastur sphenurus*).—Several clutches, 2 to 3 eggs, were taken; some spotted, others almost free from markings; the eggs are mostly smaller than those found near the coast. A clutch of three taken at the foothills of the Macdonnell Ranges, 16th July, 1923, measures:—A, 2.08 x 1.65; B, 2.13 x 1.57; C, 2.12 x 1.68 inches. A clutch of 3¹ in the Belltrees Collection, taken on the coast of New South Wales, measures:—A, 2.25 x 1.67; B, 2.28 x 1.74; C, 2.25 x 1.65 inches; and some coastal specimens measure up to 2.44 x 1.67 inches.

Little Eagle (*Hieraëtus morphnoides*).—Several pairs of the eggs were collected, and, as usual, are very free from markings. A clutch taken at the Finke River, near Hermannsburg, 13th October, 1923, measures:—A, 2.22 x 1.69; B, 2.13 x 1.68 inches. The nest was a large stick structure placed in a river gum (*Eucalyptus* sp.).

Spotted Harrier (*Circus assimilis*).—Clutch, 4 eggs, taken at the Finke River, near Hermannsburg, 13th October, 1923; nest placed low in a Eucalypt, the native name of which is "Elaturra." The eggs measure:—A, 2.02 x 1.68; B, 2.02 x 1.58; C, 1.97 x 1.66; D, 1.95 x 1.55 inches; slightly smaller than those found near the coast.

Australian Goshawk (*Astur fasciatus didimus*).—Several clutches, 2 to 3 eggs, were taken; set of three taken at Coporyllia Spring, James Ranges, 11th October, 1923, are free from markings, except specimen C, which is rather well blotched. They measure:—A, 1.84 x 1.40; B, 1.82 x 1.37; C 1.80 x 1.40 inches. The eggs are larger than those in the Belltrees Collection from Borrooloola, MacArthur River, Northern Territory, one measuring 1.73 x 1.38 inches.

Striped Brown Hawk (*Ieracidea berigora*).—Clutch, 2 eggs, taken at Palm Valley, James Ranges, 27th September, 1923, are the usual type, and measure:—A, 2.09 x 1.52; B, 2.03 x 1.52 inches.

Nankeen Kestrel (*Cerchneis cenchroides*).—Clutch, 3 eggs, taken from a hollow Eucalypt near Hermannsburg, 10th October, 1923, closely resemble other eggs of this species in the Belltrees Collection; one measures 1.51 x 1.22 inches.

Spotted Nightjar (*Eurostopodus guttatus*).—Clutch, one egg, taken near Hermannsburg, 13th October, 1923, is a rather large and well-marked specimen, compared with the other eggs of this species in the Belltrees Collection, measuring 1.38 x .97 inches. Another egg taken at the same locality, 5th October, 1923, is smaller, less spotted, and measures 1.33 x .93 inches. The ground colour is also paler.

Freckled Frogmouth (*Podargus strigoides phalaenoides*).—Pair of eggs was taken at the Finke River, near Hermannsburg, 16th September, 1923. Nest, the usual slight structure of twigs placed in a small tree. The eggs measure:—A, 1.81 x 1.17; B, 1.69 x 1.13.

Australian Crow (*Corvus cecila*).—Seven sets of eggs were collected, 2 of 2 each, 2 of 3, 1 of 4, and 2 of 5. The eggs appear to be of a well-established local phase of coloration, spotless specimens predominating. They were taken from different localities, and apparently from various pairs of birds. With the exception of 2 eggs, which are rather well freckled with small markings of light to dark umber, all are free from markings, are of a beautiful pale greenish-blue, similar to eggs of the imported Starling (*Sturnus vulgaris*), and are much lighter in colouring than any other eggs of the genus in the Belltrees Collection. They were collected at Palm Valley, Finke River, Hermannsburg, and Finke Valley, during September and October, 1923. Specimen measures 1.68 x 1.10 inches.

Pied Butcher-Bird (*Cracticus nigrogularis picatus*).—Clutch, four eggs, taken near Hermannsburg, 1st October, 1923, closely resemble those collected at Coen, Cape York Peninsula, and at Borroloola, MacArthur River, Northern Territory; one measures 1.27 x .92 inches.

Red-tailed Black Cockatoo (*Calyptorhynchus banksi stellatus*).—Clutch, 1 egg, taken at the foothills of the Macdonnell Ranges, 16th July, 1923. The egg was placed in a cavity near the top of a large gum-tree (*Eucalyptus rostrata*), about 50ft. from the ground, and was somewhat incubated. It measures 1.92 x 1.37. Specimens of a pair in the Belltrees Collection, taken at the Macdonnells, in 1895, measure:—A, 1.98 x 1.42; B, 2.02 x 1.46 inches.

Red-breasted Babbler (*Pomatostomus rubeculus*).—Clutch, 3 eggs, taken near Hermannsburg, 9th September, 1923, are unusually long and dark specimens, compared with typical clutches in the Belltrees Collection; one measures 1.07 x .72 inches.

White-browed Babbler (*Pomatostomus superciliosus*).—Clutch, 3 eggs, taken near Hermannsburg, 2nd September, 1923, are lighter in coloration than those represented in the Belltrees Collection from various other parts of Australia; one measures .92 x .62 inches.

Crested Bellbird (*Oreoica gutturalis*).—Clutch, 2 eggs, taken near Hermannsburg, 22nd October, 1923, closely resemble others

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Palms and Eucalypts, Palm Valley, Central Australia.
Photo. by F. L. Whitlock, R.A.O.U.

in the Belltrees Collection; ground colour, pure white, as is often the case, and not possessing the pale bluish tinge typical of the eggs of this inland species; one measures 1.04 x .78 inches.

Plumed Pigeon (*Lophophaps plumifera leucogaster*).—Several clutches, 2 eggs each, were collected at Palm Valley, James Ranges; one measures 1.12 x .79; another, 1.05 x .74 inches. Eggs laid on the ground in a slight hollow; lined with short pieces of grass.

Diamond Dove (*Geopelia cuneata*).—Two clutches, each 2 eggs, were taken at Palm Valley, James Ranges, during September, 1923. The eggs of one clutch are very round; those of the other are of the more usual oval shape; a specimen of each clutch measures:—A, .71 x .58; B, .77 x .57 inches.

Southern Stone-Plover (*Burhinus magirostris*).—Two clutches, each 2 eggs, are a very pale colour. Specimens of one pair are short swollen ovals, the others are long ovals; one example measures 2.03 x 1.52 inches. They were collected at Palm Valley, near Hermannsburg.

Black-fronted Dotterel (*Charadrius melanops*).—Clutch, 3 eggs, taken at entrance of the Finke Gorge, James Ranges, near Hermannsburg, 14th September, 1923. Eggs laid on shingle near pool in river, unusually large and well marked; one measures 1.12 x .85 inches. Several clutches are represented in the Belltrees Collection from various parts of Australia. A specimen from a coastal clutch measures 1.02 x .77 inches.

Fairy Martin (*Hylochelidon ariel*).—Clutch, 3 eggs, taken from a small colony found nesting under an overhanging rock at Palm Valley, James Ranges, 3rd October, 1923. Eggs are pure white, devoid of markings, and very pointed at the smaller end; one measures .70 x .46 inches.

Rainbow Bird (*Microps ornatus*).—Clutch, 4 eggs, taken at the Finke River, near Hermannsburg, 13th October, 1923, are unusually small; one measures .77 x .65 inches.

Ground Lark (*Anthus australis*).—Pair of eggs, taken near Hermannsburg, 18th August, 1923. The eggs are the smallest and palest of the species represented in the Belltrees Collection. A specimen measures .78 x .62; an example from New South Wales, .92 x .64 inches.

Rufous-breasted Whistler (*Pachycephala rufiventris*).—Clutch, 3 eggs, taken near Hermannsburg Mission Station, 2nd October, 1923, are unusually pale, and the most rounded of the species in the Belltrees Collection; one measures .78 x .67 inches.

Redthroat (*Pyrrolaemus brunneus*).—Clutch, 2 eggs, taken near Hermannsburg, 1st October, 1923; smallest and palest specimens of the species in the Belltrees Collection; one measures .71 x .54 inches.

Chestnut-eared Finch (*Taniopygia castanotis*).—Clutch, 5 eggs, taken at Palm Valley, James Ranges, 1st October, 1923, are very small, pure white, and devoid of the pale bluish tinge often seen in the eggs of this species. They are the smallest eggs of the

Finch family in the Belltrees Collection, one measuring .50 x .37 inches.

Pale Red-browed Pardalote (*Pardalotus rubricatus pallida*).—Clutch, 4 eggs, unusually small for this species. Taken at the Finke River, near Hermannsburg, 13th September, 1923; one measures .62 x .47 inches. Eggs placed in the usual tunnel with a nest at the end.

Western Pallid Whiteface (*Aphelocephala castaneiventris pallida*).—One egg, taken near the Hermannsburg Mission Station, 13th September, 1923, unusually oval, measures .73 x .50 inches.

Yellow Weebill, Treetit (*Smicrornis flavescens*).—One egg taken at James Ranges, Finke River, 20th August, 1923, measures .58 x .43 inches. Nest suspended from branch of Eucalypt.

Black and White Fantail (*Rhipidura leucophrys*).—Clutch, 3 eggs, taken at the Finke Gorge, James Ranges, near Hermannsburg, 8th October, 1923. Very swollen ovals in shape, with a rather whitish ground colour, encircled at the thickest part with the usual band of umber, slate and lilac markings; one measures .73 x .57 inches.

Black-faced Wood Swallow (*Artamus cinereus*).—Two clutches, each 3 eggs, and well marked; taken near Hermannsburg, during October, 1923. They closely resemble other eggs of this species taken in Western Australia. A specimen from each clutch measures respectively:—.83 x .63 and .92 x .67 inches.

Yellow-throated Miner (*Myzantha flavigula*).—Several clutches were collected at the James Ranges, near Hermannsburg; eggs vary considerably in size, shape and general colouring and markings; and closely resemble those from the East Murchison, W.A. Specimens from two clutches measure respectively:—C, 1.02 x .72; A, .92 x .70 inches.

Grey-headed Honeyeater (*Meliphaga keartlandi*).—Three clutches, 2 eggs each, were taken in the James Ranges, during September and October, 1923. They possess more of a pinkish salmon ground colour, and are more rounded or swollen in shape than is the case with those collected by Mr. F. L. Whitlock at the Coongan River, North-West Australia, 1908. A pair measure:—A, .80 x .59; B, .74 x .57; compared with a pair from the Coongan River:—A, .78 x .55; B, .80 x .56 inches.

Lesser White-plumed Honeyeater (*Meliphaga penicillata leilavalensis*).—Some clutches, each 2 eggs, were taken near the Finke River, Hermannsburg, during October, 1923; they are almost identical in colour, markings, shape and size, with those taken at the Daly River, Northern Territory. A Hermannsburg clutch measures:—A, .78 x .57; B, .79 x .57 inches.

Singing Honeyeater (*Meliphaga virescens*).—Clutch, 2 eggs, taken on James Ranges, 4th September, 1923. The eggs are rather dark in colour, and are the smallest belonging to this species from various parts of Australia. The pair measures:—

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A Group of Palms, James' Ranges, Central Australia.

Photo. by F. L. Whitlock, R.A.O.U.

A, .76 x .57; B, .78 x .58. Another set measures:—A, .77 x .58; B, .81 x .59 inches.

White-winged Wren (*Malurus leuconotus*).—Clutch, 3 eggs, taken at James Ranges, near Hermannsburg Mission Station, 9th September, 1923. Eggs different from those in the Belltrees Collection, and collected by Mr. F. L. Whitlock at the Coongan River, Western Australia, September, 1917, and at Lake Way, East Murchison, Western Australia, October, 1909. With the exception of a few very small, dull reddish-brown spots at the large end, they are pure white; one measures .63 x .46 in. Nest built in a dead bush surrounded by *Triodia irritans*. Parent birds near nest. Two eggs in another clutch, taken near Hermannsburg, are more rounded, and possess many more minute specks of pale reddish-brown; one measures .58 x .47 inches.

A clutch of 3 eggs was taken with an egg of the Narrow-billed Bronze Cuckoo (*Chalcococcyx basalis*) at the Finke Gorge, James Ranges, 22nd September, 1923. One of the *Malurus* clutch measures .56 x .44; the egg of the Cuckoo, .73 x .50 inches.

Turquoise Wren (*Malurus callainus*).—Two pairs of eggs were taken at Palm Valley, James Ranges, near Hermannsburg Mission Station, during September and October, 1923. A specimen measures .61 x .45 inches. The eggs are slightly smaller than others in the Belltrees Collection received from South Australia.

Pale Red-rumped Thornbill (*Acanthiza pyrrhopygia conso-brina*).—Clutch, 3 eggs, taken near the Five-mile Well, at Hermannsburg Mission Station, 7th August, 1923, do not vary much from specimens in the Belltrees Collection received from Victoria, except that the Central Australian eggs are whiter and less marked; although 2 pairs collected near Hermannsburg are well capped at the larger ends; one measures .58 x .44, while a Victorian egg measures .58 x .46 inches.

Yellow-tailed Thornbill (*Geobasileus chrysorrhous ferdinandi*).—Clutch, 4 eggs, taken at Palm Valley, James Ranges, 5th September, 1923, are similar to those of other clutches in the Belltrees Collection, except that they are whiter, smaller, and very sharply pointed at the smaller ends; one measures .68 x .47 inches.

Rabbit-poisoning and Birds.—It is interesting to note that since rabbit poisoning has been discontinued in the Riverina district all birds have increased. This particularly refers to the Superb Parrot or Green Leek (*Polytelis barrabandi*), which a few years ago had become alarmingly scarce. Mr. W. S. Edgar, manager of the Gundaline Pastoral Co., on the Murrumbidgee River, states that he saw several mobs of these Parrots, some lots numbering up to a hundred birds.—A. S. LE SOUEF, C.M.Z.S., Tooronga Park, Sydney.

Journey to Central Australia in Search of the Night Parrot.

By F. LAWSON WHITLOCK, R.A.O.U., Tudor, *via* Albany, W.A.

INTRODUCTION.

About the end of the year 1922, it chanced that Mr. Robert Buck, manager, of Henbury Station, on the Finke River, and Mr. Neil McGilp, R.A.O.U., of Adelaide, met in the train as fellow-travellers to Adelaide. Mr. McGilp questioned Mr. Buck as to the probability of the Night-Parrot being found in Central Australia. Mr. Buck recalled the fact that in moving cattle near the Palmer River, a Parrot, answering to Mr. McGilp's description, had been flushed from the Porcupine-grass. Realising that he could not conveniently spare the time to prosecute a search for the bird himself, Mr. McGilp passed on the information to Mr. H. L. White, of Belltrees, N.S.W., who has financed many expeditions in search of rare and new species of birds, and ornithological knowledge has been made richer thereby.

In February, 1923, Mr. White wrote to me asking if I would undertake the search for this elusive nocturnal Parrot.

I confess I hesitated somewhat, as I always consider it more or less of a gamble to explore these dry interior regions, where the chances for and against a favourable season lean to the adverse. But I realised that, if Mr. White was willing to risk the financial burden of the expedition, it was "up to me" to do my part. The undertaking proved the longest and most arduous I have undertaken on Mr. White's behalf.

I left home on March 6th, travelling over the transcontinental line to Adelaide, where I had hoped to meet Mr. McGilp. Unfortunately, he was not able to return from his station at Moolawatana in time. I reached Oodnadatta on 16th March. So well had Messrs. Fogarty and Co. arranged things for me that I was able to leave for the north three days later. They had engaged as driver Houssian Sureen, who, though bearing a foreign name, was Australian by birth and education. Houssian's wife also accompanied us for a time in the capacity of cook. Seven camels were engaged for riding, carrying stores and impedimenta. I was thus saved much worry and trouble, for which I feel grateful to Mr. F. Jones, of Fogarty and Co.

Much fiction has been written about the beautiful adaptation of camel to the desert, the ease with which it travels through sand, and its powers of abstention from water. The real facts are that a camel flounders through loose sand, and is impeded by it just as much as a horse is. Unless he is specially trained, a camel, given the opportunity, will drink every day, and if he goes without water in hot weather for more than two days he is in distress. I can heartily endorse all that Spencer and Gillen wrote in their work, "Across Australia," about the manners, or,

THEY ARE ALL THE SAME



Young Palms, Palm Valley, Central Australia.

Photo. by F. L. Whitlock, R.A.O.U.

rather, want of manners on the part of a camel. Camels have no affection, or, to put the matter in the words of Houssian, my driver, "You cannot be kind to them." They have no gratitude, and when feeding on certain bushes smell abominably. A most disgusting habit they have when irritated or sullen is to blow the half-chewed cud all over one. When this happens the only thing to do is to change one's clothes at once. A camel that has been accustomed to work in a string becomes an obstinate animal when used as a riding camel. Step off the beaten track he will not, and will go straight forward, even with his head pulled round at right angles to his body. Such a beast was the one I rode, and in following bullock tracks through Mulga scrub, both I and my swag in front suffered accordingly. But to give the camel his due, he is a hardy beast, and immensely strong. He will live on scrub, and carry a big load where a horse would perish.

Our objective after leaving Oodnadatta was Henbury Station, on the Finke River, a distance of nearly 300 miles. We accomplished this without incident in twelve days and a half. A fair rain had fallen up country, and water was plentiful in many places. We carried two water-kegs, each of nearly twenty gallons' capacity. The country traversed has recently been described by Capt. S. A. White, in the account of his journey to Old Crown Station, on the Finke River (see *Emu*, XXI., p. 84).

With regard to bird life, the fact that struck me most was the presence of such large numbers of birds of prey; Whistling Eagles, Little Eagles, Brown Hawks, and Kites being abundant at all the larger water pools. This is in striking contrast to my experiences in the west, where the sight of three or four pairs of hawks in view at the same time was an unusual spectacle.

On arrival at Henbury, we received the kindest welcome from Mr. Robt. Buck, the manager. He had, however, disappointing news to impart, respecting the chances of finding the Night-parrot, where he had seen it a few months previously. The whole country-side had been swept bare by big bush fires, supposed to have been lighted out west by the wild blacks, who had been giving trouble in raiding and killing cattle wantonly along the Palmer River, near Tempe Downs, which adjoins Henbury Station. Mr. Buck advised me to try north of the James Ranges, where I should find the country less disturbed. So after enjoying his hospitality at Henbury for a couple of days, we set out again. This time our objective was the Hermannsburg Lutheran Mission Station, between sixty and seventy miles further up the Finke River. Mr. Buck also advised camping for a day or two at Boggy Pool, a large permanent water, about forty miles up the river, and at the foot of the James Ranges.* This pool was represented as the haunt of many aquatic birds. We reached the spot three days later, having in the meantime spent a

*Shown on the Horn Expedition map as the Kinchauff Range.

day at the "Running Water"—a series of large pools on the Finke.

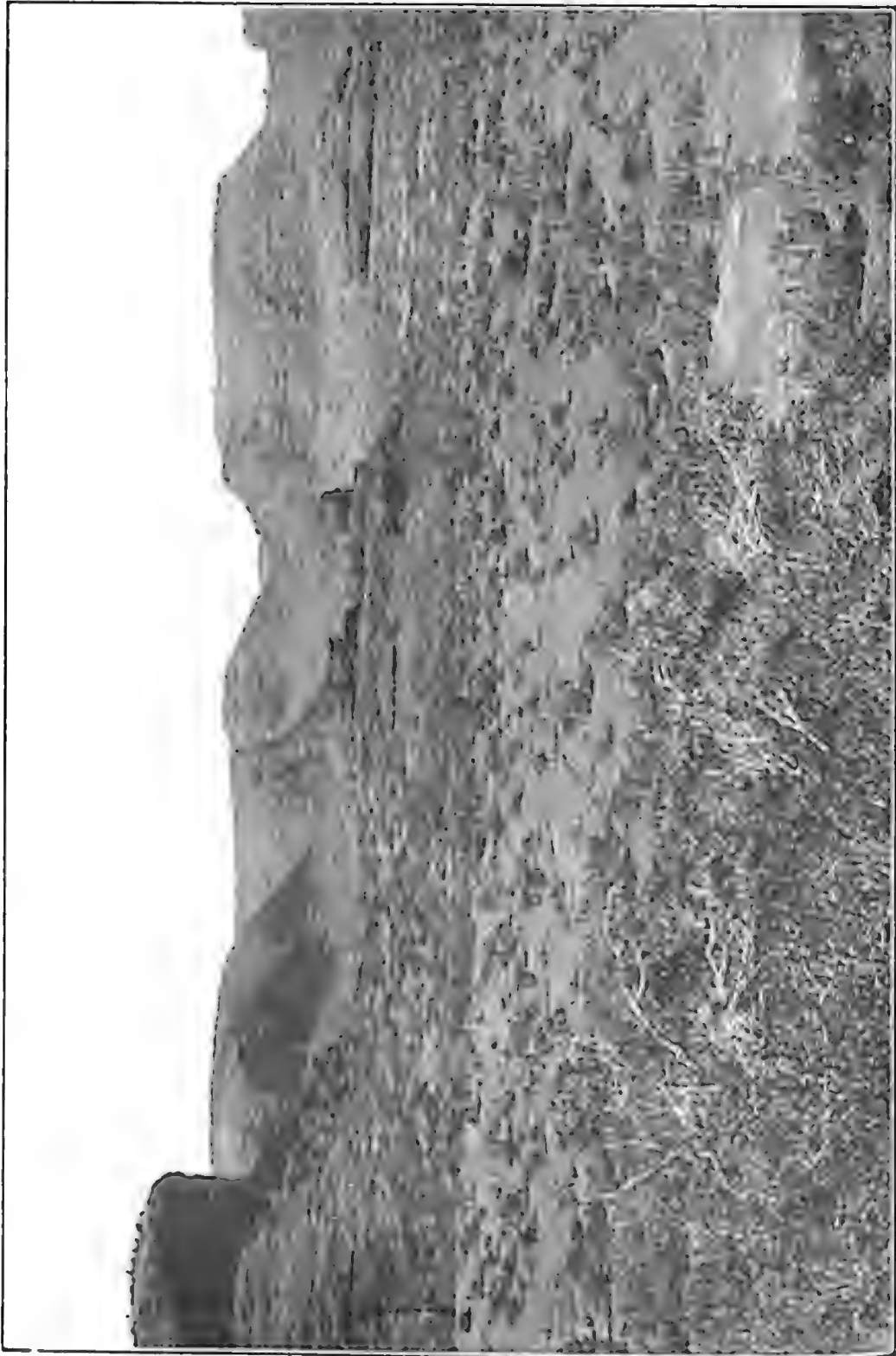
I commenced collecting birds in earnest at Boggy Pool, with good results, but unfortunately succumbed to a sharp attack of dysentery. After I had suffered for a day or two, Houssian, who was alarmed at my condition, rode in to the Mission Station for medicine. He returned the same day with necessaries, and a message from Mr. H. A. Heinrich, of the Mission, that he would be out on the following day with a buggy to bring me in to the homestead. In the meantime, I took a turn for the better, and when Mr. Heinrich arrived was on my feet again. It was deemed advisable, however, for me to go back with him, and take a few days' rest, and also to be put on invalid's diet for a short period. I reluctantly consented, being loth to leave a locality where Blue Wrens (*Maluri*—new to me), Bower-birds, and Grey Honeyeaters (*Lacustroica*) were present.

Thanks to Mr. Heinrich's care, I was soon ready for work again. During my convalescence, Mr. Heinrich had greatly aroused my interest by his photographs and descriptions of the Palm Valley, a locality some ten miles south of the Mission homestead. It was arranged that my next camp would be there. Houssian having come through with the camels, we moved down to the Palm Valley on April 30th, 1923.

I had read in the press accounts of a Palm Paddock, near Hermannsburg, but on arrival at our camping ground found this rather misleading. I had pictured a large paddock dotted all over with groups of palms and other tropical vegetation. In reality, the Palm Paddock is a vast amphitheatre, but by no means a level one, situated in the heart of the James Ranges. It is of many thousand acres in extent. The palms themselves are confined to a large creek at the foot of the ranges, forming the northern boundary of the amphitheatre. The main body of the palms occupies the creek for a distance of about two miles. Smaller groups are found in the Illamurta Creek, which joins the main creek, in the Palm Valley, about a mile from the junction of the latter with the Finke River. Another isolated colony of palms occupies the Glen of Palms, a small and very rocky creek, entering the river from the west, some five miles farther down the stream. Small groups and isolated palms are found right down the Finke as far as "Running Water."

These palms (*Livistona mariae*) are found nowhere else in Australia, and are no doubt survivors of a long past tropical flora. In part of their habitat, they are associated with numerous Cycads (*Encephalarctos macdonnelli*), which appear to grow out of the rocky walls of the neighbouring cliffs. The nearest ally of these palms is said to be the Queensland Cabbage Palm. I estimated the highest specimens at over one hundred feet. A fallen and decapitated trunk measured fifty-eight feet in length. To this might fairly be added another twenty feet to the tip of the

1. The first of these is the fact that the *SN* is not a *SN*.



A General View, James' Ranges, Central Australia.
Photo. by F. L. Whitlock, R.A.O.U.

topmost frond. Apparently several of the group, of which it had once been a member, were much taller. Of palms of twenty feet and over there must have been five or six hundred in the main valley; whilst young trees, excluding seedlings, of which I found hundreds, would total over one thousand. I could not estimate the number in the Glen of Palms, as I did not fully explore the locality. At a guess, I should say there are nearly 200 palms of over twenty feet in height. The entrance to the glen is marked by a group of twenty-five palms growing in the bed of the Finke River. These beautiful palms and their picturesque surroundings form fitting homes for such interesting and lovely birds as the Guttated Bower-bird, Blue Wrens (*Maluri*), and Grass Wrens (*Amytornis*). It is to be hoped that ere long Palm Valley will be declared a National Park. Stock, fortunately, are doing no injury at present. Palm Paddock is set aside for horses.

The scenery of the whole Palm Paddock is very picturesque. The surrounding hills are lofty and composed of a dark red sandstone, which has been weathered into fantastic shapes. In many places the cliffs are sheer precipices, without tree or vegetation; in others, huge portions have become isolated into turrets and pyramids, some of which stand sentinel-like in the midst of the amphitheatre. The surface of the ground is clothed with innumerable large bushes, with here and there a Bloodwood or other Eucalypt. On the more gently sloping cliffs are numerous native pines (*Callitris verrucosa*), wild fig-trees, and a beautiful species of *Tecoma*. The season of 1923 was a poor one for wild flowers and herbage, but a plant, locally called "the Wild Carrot," was abundant, and flowering freely near our camp. A species of wild tobacco, too, was plentiful in moist, shady places near the main creek. Mistletoes of several species abounded, and were much frequented by Mistletoe-birds and Honeyeaters of various kinds.

Whilst we were camped in the Palm Valley a good rain fell in May, and still better falls occurred in June. In the latter month, 285 points were registered at the Mission. This was very beneficial in providing an abundant supply of surface water, and in promoting the growth of trees and shrubs, but it unfortunately fell at a time of the year when it was of little use in producing the much-valued herbage. It, however, induced two local species of *Triodia* (Porcupine) to flower and seed abundantly. Throughout my stay in Central Australia the rainfall falsified all predictions.

Having been cordially invited to make the Mission homestead my headquarters, I gladly accepted. The Finke mail, as it is called, comes in to Hermannsburg once a month, and it was a great convenience to receive and despatch letters on its arrival and departure. Using the Mission as a base, I made excursions to the east, amongst the big Mulga scrub and low hills covered

with *Triodia*, and also up the Ellery Creek into the heart of the adjacent Macdonnell Ranges. To the west, I camped several times at Coporyllia Spring, where pure water was in plentiful supply. Also I visited the Lilgera Spring, and camped for some little time at the series of springs in the Gilbert Creek. Further west, in company with Mr. Heinrich, I visited the Gosse Ranges, and from there travelled to Umbatcha Spring, in the centre of the great Missionary Plain. From the latter spring we rode to the Finke Gap, where the river passes through the southern chain of the Macdonnells, and the Horn Valley. I camped, too, at various places on the banks of the Finke River, between the Macdonnells and the Mission.

The Macdonnells run east and west, or nearly so, for 300 miles and comprise three parallel chains. The highest points visible were Mt. Sonder and Mt. Edwin Giles, roughly 4500 feet in elevation. The ranges, arising as they do from a tableland over 2000 feet in height, are not so imposing as their altitude would suggest. Parallel with the Macdonnells, the James, or Krichauff, Ranges run for about 200 miles; they are not very picturesque on their northern aspect, the highest point, the Hermannsburg, being a little over 3000 feet in elevation. Curiously enough the Finke River cuts through these ranges at the foot of the Hermannsburg, and, after a tortuous course of nearly forty miles, it clears them at the "Running Water." This portion of the Finke Valley presents some striking cliff scenery, and is well watered; the various pools being margined with reeds and well populated with a good variety of bird life. The Gosse Ranges are a small isolated group of rocky hills, some forty miles west of the Mission, and standing between the James and Macdonnell Ranges. One enters them through a narrow, winding gorge. They contain some fine rock-holes, with water, which rarely go dry. From the western end of the ranges, one looks over virgin country, with no evidence of civilisation, until one reaches the rabbit-proof fence in Western Australia.

The great Missionary Plain averages about fourteen miles in breadth, with a length of 300 miles. It is clothed with a great variety of vegetation. In places extensive Mulga scrubs, in others tracts of *Triodia*, and again sandy country, with grass-trees (*Xanthorrhæa*) and Desert Oak (*Casuarina Decaisneana*). I did much work on the Missionary Plain, and on the northern slopes of the James Ranges, with what success the following account will show. It was in these two localities I made special search for the lost Night-parrot (*Geopsittacus occidentalis*).

The climate of Central Australia is a fine, healthy one. The heat is not so great as in our north-west. For the last six years the highest temperature recorded has been only 108deg. in the shade. The periods of heat never last long. In the winter months the early mornings are sharp and bracing, with genial sunshine in the middle of the day. The rainfall recorded from



Rock Face, near first Palms, James' Ranges, Central Australia.

Photo by F. L. Whitlock, R.A.O.U.

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1888 to 1915 averages 9.18 inches. I have chosen this period, as there was nothing abnormal throughout its duration. The wettest year was 1895, with a rainfall of 18.31 inches, and the driest 1915, with a fall of 2.24 inches. In a period of 42 years, the average fall at Alice Springs, 85 miles to the west, was 10.71 inches. The year 1879 recorded 27.21 inches. The wettest months in Central Australia are December, with an average of 1.37 inches; January, 1.45 inches; and February, 1.20 inches, respectively.

In March, 1921, a tremendous flood came down the Finke River, due to a cloud burst in the Macdonnell Ranges, and for some hours the Mission buildings were in danger, the flood waters washing away the soil close up to the foundations. As it was, several wells caved in, and the vegetable garden was completely obliterated. From June, 1920, to June, 1921, inclusive of both months, 31 inches of rain were recorded.

During my visit to Central Australia, 123 points of rain fell in May, and 285 points in June. After this a disappointing period of drought set in, which remained unbroken until a series of thunderstorms came along on October 29th and 30th—too late to have a beneficial influence on the breeding of local birds.

August was the coldest month, with many frosty mornings. On 7th ice formed on water left in a washing bowl to a thickness of three-quarters of an inch. We had fairly thick ice in the early hours up to 21st of the month. The last three days were marked by a period of bitterly cold winds from the south-east.

Central Australia has been visited by other naturalists. In May, 1894, the large and well-equipped Horn Expedition left Oodnadatta, and returned the following August. Mr. G. A. Kearsland was the ornithologist accompanying the party. The season is reported as being "somewhat dry," and "rapid travelling" was the rule. This probably accounts for a number of species found by myself not being recorded. Seventy-eight species were secured, five being described by the late A. J. North as being new to science. A few more species are recorded as seen, but no specimens were collected. It was an agreeable coincidence to meet a member of the Horn Expedition in Central Australia, in the person of Sir Baldwin Spencer, who arrived at the Mission on May 26th, in company with Mr. Keith Ward, the geologist.

In 1913, Capt. S. A. White and Mrs. White visited the Macdonnell Ranges. An account of the trip was published in the *Journal of the Royal Society of South Australia*, vol. XXXVIII., 1914. I regret I was unable to refer to a copy of this publication. Captain White also paid a short trip to Old Crown Station on the Finke River in 1921. A list of birds observed was published in *The Emu* (vol. XXI., p. 84).

In the early pioneering days along the Finke River, the late

Constable E. C. Cowle collected a little around Illamurta Police Station, securing, amongst other things, the first authentic eggs of the Guttated Bower-bird.

The native names of birds given are in the Arunta dialect. The majority are taken from the list of totem names compiled by the late Rev. C. Strehlow. In some cases the spelling has been slightly altered to comply with English pronunciation. The scientific names and vernaculars are in accordance with the second edition of the Official Checklist.

BIRDS OBTAINED* OR OBSERVED.

Annotations [in brackets] by A. J. Campbell, C.M.B.O.U., Etc.

Dromaius novæ-hollandiæ. Emu (Ilia).—Very few seen. On the outward journey a small party observed in the sandhill country north of Macmillan's Plain. A few eggs were brought to the Mission by aborigines about the end of May. Tracks of Emus were occasionally seen in various places, and on the return journey a fine pair were running ahead of the camels when north of Wire Creek bore.

Leipoa ocellata. Gnow or Mallee-Fowl (Ngamara).—I did not meet with this bird myself, but Mr. Heinrich was informed that a nest with eggs had been found in June, a few miles from the Mission Station. It is well known to the aborigines.

Turnix sp. Quail.—An idea of the dry state of the country will be gathered from the fact that only two Quail were seen during the whole period I was in Central Australia. Both were of a small species of the size of *Turnix velox*, the Little Quail.

Geopelia cuneata. Diamond Dove (Ntapa).—Rather local, perhaps commonest in the Palm Valley, where it was breeding August and September. A pair were nesting in Miss Kunoth's aviary at Oodnadatta.

Phaps chalcoptera. Bronzewing.—A few found in the big Mulga scrub at the "Five Mile" Well, east of the Mission. On August 9th I found a nest on the horizontal limb of a big Mulga, containing a newly-hatched young bird and a second egg just chipping. A second nest with a pair of eggs was brought to the Mission a little later. A nest with eggs was also found in the Palm Valley.

Lophophaps plumifera leucogaster. Plumed Pigeon (Nturuta).—These pretty birds were common in the ranges at all the various pools and springs. In the Palm Valley and around Coporyllia they were numerous. The call note differs from that of the North-western species (*L. ferruginea*), and is not badly rendered by the Arunta name—"Nturuta." Nests were found amongst the *Triodia* growing on the lower hills of the ranges. They were poor affairs. Usually a little hollow was scratched, under the lee of a tuft of grass or *Triodia*; this was lined with short pieces of grass stems. In some cases the eggs lay on the bare ground, with a few stems surrounding them. In one instance I found a pair of well-grown young in the bed of the main creek in the Palm Valley. The nest was sheltered by a large stone. The breeding season is during the months of August and September.

Ocyphaps lophotes. Crested Pigeon (Palkara).—A fairly common bird in the Finke Valley, and generally found coming to water at all the permanent pools and springs. On 3rd July, Thomas—our guide—found a nest near camp in the Macdonnell Ranges, but unfortunately

*Indicated by a cross (†), total 179 specimens, donated by Mr. H. L. White to the National Museum, Melbourne.



Nest and Eggs of the Plumed Pigeon (*Lophophaps plumifera*) in Porcupine-grass

Photo. by F. L. Whitlock, R.A.O.U.

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broke the eggs in coming home. Near Umbatcha Spring on August 1st. I found a nest with two newly-hatched young. This species was especially common around Umbatcha Spring, which is situated right in the centre of the great Missionary Plain.

Porzana plumbea. Spotless Crake.—I heard the well-known notes of this species issuing from a dense growth of reeds, lining a pool near the entrance to the Glen of Palms, in the Finke River.

Tribonyx ventralis. Black-tailed Native-hen (*Luka duradura*).—A few around the pools near Henbury Station, but not seen higher up the Finke.

Porphyrio melanotus. Black-backed Swamp-hen (Bald Coot).—Identified on a pool near the entrance to the Finke Valley in the James Ranges, and again amongst the reeds at the Hamilton bore stream.

Fulica atra. Coot.—Numerous on some of the Finke pools, especially at Boggy Pool.

Podiceps ruficollis. Little Grebe (*Terkateratera*).—Pairs were seen on a pool in the Ellery Creek, Macdonnell Ranges, and in one or two other places. At Hamilton bore stream I watched a half-grown young one diving for food.

Phalacrocorax carbo. Black Cormorant (*Nkebara*).—A numerous flock at Boggy Pool, and another at the Finke Gap in the Macdonnells. A third favourite haunt is a deep pool at the source of the Ellery Creek. High cliffs are present at each of these localities. I examined these cliffs carefully with the aid of a field-glass, but failed to find any traces of nests. Smaller parties and pairs were also seen on the Finke, and in the Palm Valley and again at the Hamilton bore stream.

Phalacrocorax ater. Little Black Cormorant.—Identified near pools in the Palm Valley and on the Upper Finke River.

Phalacrocorax fuscescens. White-breasted Cormorant (*Liljana*).—Frequently seen on the Finke and also in the Palm Valley.

Anhinga novæ-hollandiæ. Australian Darter (*Tantana*).—Pairs seen in several places along the Finke, notably at Boggy Pool. Another pair observed at the Hamilton bore stream. Their clattering notes were heard.

Pelecanus conspicillatus. Pelican.—A flock of about thirty seen at various times near the Mission. A smaller flock also noted at Boggy Pool. A few observed again near Henbury Station. At Hamilton bore stream, the remains of two Pelicans were found lying on the bank.

†**Erythronys cinctus.** Red-kneed Dotterel.—Met with at a long pool on the Finke River, and also at the pools formed by the Gilbert Springs. Pairs were about to breed when I left the latter locality.

Zonifer tricolor. Banded (Black-breasted) Plover.—Heard at night only on one or two occasions on the journey up.

Charadrius melanops. Black-fronted Dotterel.—Common at all pools along the Finke, and also in the Palm Valley. Several nests containing three eggs were found. On 26th September I found an egg laid in a slight cavity of the sandstone rock, in the Palm Valley Creek. Next day, about 3 p.m., a second egg was laid. The two following days no further egg was laid, but the female was not sitting. I do not know when the clutch was completed, as I shifted camp.

Actitis hypoleucos. Common Sandpiper.—A single individual at Gilbert Spring, last week in August. I did not shoot it, as I am very familiar with this species, and have found numbers of its nests in the north of England. It comes as far south as Wilson's Inlet, my home, near Albany, Western Australia.

Glottis nebularius. Greenshank.—A single example seen and watched at Boggy Pool, on the Finke.

†*Rhyacophilus glareolus*. Wood-sandpiper.—On August 25th an immature specimen was shot at a large pool on the Finke, near the foothills of the Macdonnell Ranges. [An extremely interesting find. There are only a few recorded instances of this northern bird occurring in Australia.]

†*Pisobia acuminata*. Sharp-tailed Stint.—An immature example shot at a pool in the Palm Valley, and another from a party of seven at Boggy Pool. Three or four more were at the Hamilton bore stream, 75 miles north of Oodnadatta.

Burhinus magnirostris. Southern Stone-plover (Tineljara).—Heard calling at nights at all our camps on the outward journey, and also seldom absent from the many localities visited during the expedition. Hitherto I had never seen a flock of this species, but at the Palm Valley a low-rounded hill, covered with large Mulga and other bushes, was a favourite camping place. On one occasion a party of about twenty arose from this hill, but I noticed they split up into pairs as they flew away. Eggs were found in the Palm Valley and near the Mission. The breeding season commences in August, and lasts till October. Not more than two eggs were found.

Eupodotis australis. Australian Bustard or Plain Turkey (Itoa).—A few seen during the outward journey, notably in crossing Macmillan's Plain, but owing to the dry conditions nowhere plentiful this season. Near the Mission I met an aborigine carrying two fine ones which he had killed a short distance away. They were excellent eating when served at the Mission table. Mr. Heinrich gave me an egg taken in the neighbourhood some years previously.

Threskiornis spinicollis. Straw-necked Ibis.—One or two seen around pools in the Upper Finke, and again in the Palm Valley.

Platalea regia. Royal Spoonbill (*Rata rata*).—A single and very tame individual was seen in the Palm Valley. A second one at Boggy Pool.

Egretta intermedia = *plumifera*. Plumed Egret (*Eroamba*).—Occasional small parties of this beautiful bird were seen on the pools of the Upper Finke.

Notophox novæ-hollandiæ. White-faced Heron (*Ntjuara*).—Equally numerous with the last.

Notophox pacifica. White-necked Heron (*Ibara*).—Pairs in many places on the Finke. The plumage of the upper parts seemed to vary between a slate-colour and black. Two nests that had been recently occupied at the western end of the Palm Valley may have belonged to this species. They were in small trees growing on the sides of a steep cliff.

Dupetor flavicollis. Black Bittern.—Only seen near pools in the Finke Valley where it traversed the James Ranges. A pair was standing near an empty nest in a Eucalypt, adjacent to Boggy Pool. I saw nothing of the Nankeen Night-heron, which other ornithologists had noted in Central Australia.

Chenopsis atrata. Black Swan.—A stray bird seen on the big pool at the Finke Gap, north of the Horn Valley. Mr. F. Raggatt also saw this bird, and regarded its occurrence as a rarity in the neighbourhood. Mr. Raggatt has resided at the Finke Gap for many years.

Tadorna tadornoides. Chestnut-breasted Shelduck (Mountain Duck).—A party of seven was seen at Boggy Pool.

Anas superciliosa. Black Duck—Small flocks seen at nearly all pools, in company with Grey Teal.

Virago gibberifrons. Grey Teal.—During the present season this was by far the commonest Duck observed in Central Australia. It was met with on all pools, also at the Gilbert and Coporyllia Springs, and again on all waterholes in the Palm Valley. I think members of the Duck family breed in Central Australia after floods

or during the summer rains. I dissected any shot for food, and none showed signs of breeding. Flocks had not broken up, and Ducks in pairs were notably absent.

Malacorhynchus membranaceus. Pink-eared Duck.—A few small parties seen, notably at Boggy Pool.

Calyptorhynchus banksi stellatus. Red-tailed Cockatoo (Iranda).—More of this species of Cockatoo were seen on the outward journey than in the country explored. We camped on Macmillan's Plain, both going and coming, and fairly large parties of Red-tailed Cockatoos passed over at sunrise and sunset. A few pairs were breeding a long way up the Ellery Creek, in the Macdonnell Ranges. On July 9th I saw an old bird emerge from a hole in a big Eucalypt as I was riding on my camel. Investigation revealed a single young bird a day or two old. On 16th July I found another nest-hole, and Thomas—our guide—climbed up and secured the one egg it contained. A few pairs were reported up the Sandy Creek, which falls into the Finke at the Mission, but there was no water up the creek at which we could camp.

Circus assimilis. Spotted Harrier (Etaturra).—An uncommon bird, but clearly identified on several occasions; notably at Boggy Pool, on the Finke River, where it emerges from the James Ranges. One of the last clutches of eggs brought in by the aborigines was a set of four, referable to this species. They were heavily incubated, and taken from a nest low down in a eucalypt. The native who gave me them told me that Etaturra hunts for the eggs of the Emu, which it breaks in order to feed upon the contents. On inquiry, this information was confirmed by other natives.*

†*Astur fasciatus*. Goshawk (Indola.) — There were two species of Goshawks around the James Ranges and in the Upper Valley of the Finke. But this, the larger one, was much less frequently seen than a second and smaller species. Both were breeding in September and October, which is rather later, generally speaking, than the nesting period of other hawks. The present species preferred to nest in the trees growing along the tributary creeks of the Finke. Several nests containing eggs were found. The nests were fairly large, built of small sticks, and neatly lined with green leaves.

[Only one skin of a Hawk, that of a female Goshawk, was procured during the expedition. The general upper surface is light drab, or drab, and the under surface wood brown (barred), as against upper surface dark drab grey, or fuscous, and under surface dark fawn colour of a typical female from New South Wales. Respective dimensions (which vary little), in millimetres, are—

(a) Length 508, culmen 25, wing 315, tail 225, tarsus 82.

(b) Length 520, culmen 25, wing 305, tail 230, tarsus 72.

Similarly coloured skins (of females) in the H. L. White collections are from the following localities, viz.:—

Tarana, N.S.W.; wing, 313 mm.

Borrooloola, N.T.; wing, 287 mm.

King River, N.T.; wing, 280 mm.

Naretha, W.A.; wing, 305 mm.

The Central Australian specimen might be referred to G. M. Mathews' *A. f. didimus* (A.A.R., I, p. 33), of which the bare type description is:—"Differs from *A. f. fasciatus* in its smaller size; wing, 236 mm." (Judging by the small wing, the specimen was possibly a male.) As a northern or geographical race, this seems feasible, until one finds in the same collection from Napier Broome Bay, far North-western Australia, a female specimen as dark as any typical bird from New South Wales, almost black on the head and broad brown-barred beneath; wing, 280 mm.]

*This habit has also been attributed to the Black-breasted Buzzard (*Gypocittinia melanosterna*).

Astur cruentus. Lesser Goshawk (*Indola*).—This second species of Goshawk was the commoner of the two. Nowhere was it more common than near the junction of the Palm Valley Creek with the Finke River. The birds were generally seen hunting about the sandstone cliffs and slopes in the more open parts of the valley. It was easy to identify them by their flight and general appearance, which differs considerably from that of true Falcons or Kites. The male bird looked quite a little fellow; hardly bigger than a female Sparrowhawk (*Accipiter cirrhocephalus*). The long tail of the female made her appear much larger than she actually was. Several nests were found. In each case they were built on horizontal limbs of eucalypts, the foundation being laid on an outward fork. They were difficult of access, and in two cases the eggs were obtained only by tilting the nest with a long stick, and by catching the eggs one by one in a hat below. This is a risky business, and one egg was irretrievably ruined in consequence. The eggs are conspicuously smaller than those of the common Goshawk, and are somewhat pointed at the smaller end. A pair only, as a rule, was found; but one nest contained three eggs. One of the latest nests found on the expedition was a nest of this species. It was found on 28th October, a few miles south of Horseshoe Bend, on the Finke River. I was riding the leading camel. In passing a small bloodwood eucalypt I observed a hawk fly out on the far side. It looked like a male Goshawk. Houssian climbed to the nest, which was barely fifteen feet from the ground. It contained two fresh eggs, one boldly marked, the other quite plain.

[A second variety of Goshawk in the Macdonnells is interesting. However, from a cabinet point of view, and the examination of a large series of skins, one thing is fairly certain: There is but one species of *Astur fasciatus* frequenting Australia and Tasmania.]

Accipiter cirrhocephalus. Collared Sparrowhawk.—Distinctly rare, and only identified with certainty on one or two occasions. On the return journey we camped for one night by the Stevenson Creek. A pair of these little hawks were roosting in a tree on the other side of the creek.

Uroaetus audax. Wedge-tailed Eagle (*Eritcha*).—This Eagle was met with throughout the expedition. Usually seen singly, but occasionally three were in sight at the same time. On the desolate tracts of gibber country, it was most frequent; it was also not uncommon amongst the foothills of the James and Macdonnell Ranges. On August 3rd, 1923, in the latter locality, a new nest was found, placed about twenty feet from the ground in a solitary beefwood tree. It was the usual platform of sticks, abundantly lined with sprays of eucalyptus leaves. It contained one very handsome fresh egg. The female could be seen on the wing, about five hundred yards away. Whilst Mr. Heinrich, Thomas and I were at the tree she ventured no nearer. Three weeks later I visited the nest again, and a second egg, a little incubated, was in the nest. This egg was in great contrast to the first, the markings, though plentiful, being of a very pale grey. A few days later Thomas, who had been hunting Euros in another part of the foothills, reported a nest with three young birds about a fortnight old. A third nest was found in the James Ranges, near the beautiful Palm Valley, by another aborigine. It contained two heavily-incubated eggs.

Hieraetus morphnoides. Little Eagle (*Eritchailbala*).—Much less common than the Whistling Eagle. This is curious; as on the rivers of North-west Australia, it is the Little Eagle that predominates. Pairs were seen in many places, notably near the Finke Gorge, where it cuts through the southernmost chain of the Macdonnells. Nests with eggs were found, always near large creeks or the Finke River.

Haliastur spheurnus. Whistling Eagle (Irkalentcha).—This was, perhaps, the commonest bird of prey observed throughout the expedition. It was met with from Oodnadatta outwards right up to the Macdonnell, and westwards to the Gosse Ranges. It was most numerous along the Ellery Creek, a large tributary of the Finke, rising in the heart of the above ranges. Some idea of its abundance may be gathered, when I state that no less than thirty-eight were counted flying above the carcass of a recently deceased bullock. This was during the breeding season. This species must, to some extent, be nocturnal. Dingoes in the ranges were very plentiful, and a nuisance at night, howling around the camp, disturbing us and a dog we had with us. I got Houssian to procure a little poison, and one or two baits were put near the camp, but not until nearly all daylight had disappeared. The baits that had not been eaten were picked up again at daybreak to prevent Crows or other birds getting hold of them. Nevertheless, I was very sorry to find several dead Whistling Eagles during the following days. Any dogs that were poisoned were promptly burned. This Eagle is a useful bird, as it preys largely upon rabbits, which are only too plentiful in Central Australia. The nesting season commences in June. On 16th July a nest containing three eggs was seen in a large eucalypt on the banks of Ellery Creek. A little later a nest containing young birds was examined.

The Whistling Eagle has the peculiar habit of carrying the dried skins of rabbits, on which it has been preying, to the nest. The female broods on these. Thomas climbed up to several nests, which contained only skins, though the female was observed brooding before he ascended the tree. Whilst he was at these nests both parents flew around uttering anxious cries. Intervals of several days elapse between the laying of the eggs. On the return journey nests were observed along the Finke River with fully fledged young sitting in them. This species seems to favour the neighbourhood of isolated pools of water.

Milvus migrans. Black (Fork-tailed) Kite (Inkulkna).—Next to the Whistling Eagle, this was the commonest bird of prey seen during the expedition. The morning after arriving at Oodnadatta revealed Kites wheeling about over the township and surrounding country. On the journey up country water was fairly plentiful, and at all pools birds of prey were present, Kites generally predominating. In all parts of Western Australia I have visited they are rare. At first I was much puzzled to distinguish the Square-tailed Kite from the present species, as I had no book of reference with me. At rest, the tail of this Kite is deeply forked. On the wing, the half-expanded tail is slightly forked, whilst the fully expanded tail is square, except the central feathers, which then appear to be slightly the longest. During my convalescence at the Mission Station, it was one of my pleasures to walk up and down under the verandah and watch the Kites. Usually, there were from ten to twenty birds wheeling about, not thirty feet above the Mission buildings, and a favourite little gum tree often contained nine or ten birds at rest in its branches. The little aboriginal boys tormented these Kites by throwing up pebbles, upon which the birds, taking them for food, swooped down. When a beast was killed and cut up on the bench at the meat-house, the Kites disputed with the Crows for the fragments remaining. After a time I was able to distinguish an occasional Square-tailed Kite amongst the commoner species. I take this opportunity to point out the lack of a good portable manual of Australian birds, written by a field naturalist, from a field naturalist's point of view, giving the general appearance of large species as seen on the wing from

below. It is usually the underparts of large birds that are visible to the field observer. Mathews and Iredale's fine Manual is both too valuable, and too bulky, to be carried about. One wants a small "handy" book, that one can stuff into a collecting bag. Here is a chance for a competent man with leisure to confer a lasting blessing on the Australian field naturalist. Having never seen a Kite's nest, I was naturally anxious to find one, but several of the most intelligent aborigines assured me that the "Inkulkna" did not breed in the Mission country. This proved to be correct. At the middle of August we were camped at the Gilbert Springs, some 24 miles west of the Mission. We arrived on the evening of 26th August. Whilst having tea a party of seventeen Kites flew to the westward; they were travelling at a height of about 1000 feet. On returning to the Mission, 13th September, not a Kite was to be seen. In the meantime, we had camped at Coporyllia Spring, and also by the Finke River. The same state of things prevailed at both localities. A little later on, when re-visiting the Palm Valley, Kites were also absent. The only evidence that I gathered as to Kites occasionally breeding in the Mission country was that of a pair of finely speckled eggs of a bird of prey, brought to the Mission by an aborigine in the month of October. He said they were eggs of the Inkulkna. Unfortunately, they were useless as specimens. They much resembled a certain variety of the eggs of the European Black Kite (*Milvus ater*). On the return journey, when travelling by the Finke, near Horseshoe Bend and Old Crown Stations, Kites were observed sitting by nests in eucalypts on several occasions. These nests appeared to contain young.

Lophoictinia isura. Square-tailed Kite.—A few pairs identified during my researches on the Upper Finke River, and also on the return journey. No nests were found. On our outward journey birds of prey were very numerous around a pool of water at Charlotte Waters. A Seagull was reported to be there. I think it was more likely that it was a Letter-winged Kite (*Elanus scriptus*). There was no time to investigate.

Gypoictinia melanosterna. Black-breasted Buzzard.—Only one pair was identified with absolute certainty. The birds were flying overhead at a fair height near the Mission.

Geracidea berigora. Brown Hawk (*Ilkalanha*).—This noisy falcon is a common species in Central Australia, and at our various camps a pair or two were always about. I saw only the pale form; never the heavily marked dark-breasted variety. It was the first hawk abroad at daybreak, and the last to return to roost at night; and it never failed to let its arrival or departure be known. At our camp at Coporyllia Spring, a pair had a nest in a tall eucalypt. I think at one time this nest was the property of a pair of Crows, which were nesting in a neighbouring tree. Incubation was proceeding, and both male and female were observed to brood the eggs. The roosting tree was about one hundred and fifty yards away. This pair seemed to have a series of calls, which they understood. When the male returned to the roosting tree, he uttered a call to the female; she thereupon slipped off the nest. If he brought home food, she shared it. If he came empty, off she flew to hunt for herself; the male in the meantime taking her place on the nest. A number of nests were found; sometimes the eggs were laid in old Crows' or Babbler's nests—the latter being altered to suit the requirements of the hawks. Others again were noted in the hollows of big river gums (*Eucalyptus rostrata*). Several clutches of eggs were brought in to the mission station by the aborigines. The eggs varied considerably in shape, size, and markings. In Palm Valley, Thomas, our guide, robbed a Crows'

nest near the camp. A pair of *Ilkalancha* came along, and seized the empty nest. An egg was laid, but the Crows, in revenge, broke the egg during the absence of the Hawks.

Cerchneis cenchroides. Nankeen Kestrel.—Not a common bird, but more frequently seen flying over the desolate gibber country. A few pairs were also seen by the Finke River, near the Mission. I wished to obtain a specimen for comparison with western examples, but could never get within shot. Eggs were brought in to the Mission by an aborigine; they had been taken from a hollow tree.

Falco longipennis. Little Falcon.—Uncommon, but occasionally seen. At the end of September we were camped at the western end of the Palm Valley, not far from a camp of myall blacks of the Loritcha tribe. Thomas, our guide, could speak the Loritcha dialect, and he got some of the men to hunt for "kwada" (eggs) in exchange for tea and sugar. Amongst other things brought in was a set of three smallish Falcon's eggs, taken from an open nest. Though I cannot be absolutely certain, I think these were referable to the Little Falcon. Captain S. A. White reports the Grey Falcon seen in Central Australia. I was not fortunate enough to meet with this species during the expedition. I have seen it in North-western Australia.

†*Ninox boobook*. Boobook Owl (*Arkularkua*).—Heard at all our camps; sometimes very close at hand. On moonlight nights I tried to get a view of the calling birds, but they were too wary. Whilst watching Bower-birds, Houssian observed an Owl sitting in a wild fig tree growing on the side of a cliff. It was a non-breeding male, and a much darker plumaged bird than those I obtained on the Fortescue River last year. The latter are probably referable to the sub-species, *N. b. ocellata*.

[The nearest to this specimen (male) are those from Groote Island and Borrooloola—*N. b. mixta* Mathews.]

Tyto alba. Barn Owl.—Heard at night at our Finke River camps, and at Coporyllia Spring. A nesting place of this Owl was known to the aborigines, near the Mission. An egg was found in the cavity, but it proved to be a last season's egg. On being exposed to the hot sunlight, it promptly exploded, and those standing near were badly "gassed."

Kakatoe leadbeateri. Pink Cockatoo (Major Mitchell). (Nkuna).—Distinctly rare this season. A pair or two seen in travelling down the Finke between Henbury and Horseshoe Bend.

Eolophus roscicapilla. Galah, Rose-breasted Cockatoo (Ilentcha).—Commoner south of the Finke this season than further up country. At Oodnadatta a large flock came night and morning to feed in the horse-yards near the hotel. None known to breed near the Mission this season.

Licmetis sanguinea. Little Corella, Bare-eyed Cockatoo (Ankatnara).—Only a pair or two seen in the same locality as the foregoing. Mr. Heinrich thinks the sulphur-crested species occasionally visits the country, but it is not included in the Rev. C. Strehlow's list of totem birds.

Leptolophus hollandicus (= *Calopsittacus novæ-hollandiæ*). Cockatoo-Parrot (Rulkara).—A few pairs seen both on the outward and homeward journey, but none was around the James Ranges or great Missionary Plain. It seems to be governed by the state of the season in selecting its breeding grounds.

Polytelis alexandrae. Princess Parrot (Ileltara).—I did not see this Parrot in its wild state, but there was a beautiful female in captivity at the Mission Station. At Oodnadatta, at the home of Miss Kunoth, I saw a handsome pair, the survivors of six. They were accommodated in a large aviary in company with Doves and other Parrots. The present season they had bred. Four eggs were

laid, and two young were hatched. When I saw the latter they were about to acquire their first plumage; the flight feathers being well grown. Prior to this, in past seasons, when the party numbered six, eggs had been laid, but, squabbles ensuing, the eggs were generally broken. A hollow limb had been placed in the aviary for their accommodation, and the surviving pair, having exclusive possession, had successfully brought out two young ones. Miss Kunoth is at considerable trouble in gathering natural food—berries and seeds of local plants—and to this I think she owes her success in inducing birds to breed in her aviary. In the wild state Mr. Robert Buck, of Henbury, told me that about ten years ago they bred near the station in hundreds. At one time he had nearly fifty young in hand. At daybreak those that could not fly were put outside the cage, and the free birds came and fed them. He considered another visitation was about due. This year Mr. Crombie, who was working at Mr. Giles's station, north of the Macdonnell Ranges, wrote informing me of the presence of a few pairs on a creek traversing the run. I was tempted; but to reach the locality a detour of sixty miles had to be made. Owing to the big flood of 1921, the pass through the ranges at the Finke Gap had become impassable to camels. In all, the journey would have run to about 150 miles. To have accomplished this meant abandoning other things already marked down. The day I left the Mission for the last time word came in that a pair had been seen on the Ellery Creek about ten miles away.

Barnardius zonarius occidentalis. (Ulbatcha).—Common wherever there were Eucalypts, especially by the Finke River and the larger creeks. It was breeding in August. A nest was found in a hollow limb September 12th; the eggs were just chipping. Another clutch of heavily incubated eggs was brought in to the Mission Station about the same time.

Psephotus varius. Varied Parrot (Rulga Rulga).—Not nearly so common as the last, but frequently seen in Mulga country. In Central Australia, one of its names is "Mulga Parrot." At the Mission were three females and a male in a large cage. They thrived well, but made no attempt to breed. In all cases I found the male bird had yellow humeral patches, and the underparts deeply coloured with orange, whilst the female had dull red humeral patches, and no orange on the under parts. This parrot runs nimbly over the ground.

Melopsittacus undulatus. Budgerygah (Shell Parrot).—Small parties seen in many places throughout the expedition, but none was breeding.

Geopsittacus occidentalis. Night-Parrot (Tnokkapaltara).—This bird, the main objective of the expedition, proved to be a very elusive species. Though I was unsuccessful in obtaining a specimen, it may be as well to put on record what I learned about it. The first person I met who claimed any knowledge of the bird was Mr. A. Elliott, of Horseshoe Bend. Twenty years ago he occasionally saw a specimen when riding through the porcupine (*Trididia*) after cattle. It was known as the "Solitaire," never more than one being flushed at a time. After flying a short distance, sometimes almost shuffling along for a few yards, the flushed bird hastened to enter the shelter of the porcupine again. The notes were unknown to Mr. Elliott, and he had never known the nest to be found. Mr. Alan Breaden, of Idracowra, confirmed what Mr. Elliott told me. He, too, had not met with any specimens for a very long time, though years ago he thought it nothing worthy of note to flush one from the porcupine occasionally. Both these persons are old residents on the Finke River, and very experienced bushmen. On the other hand, Mr. Robt. Buck of Henbury, recently

met with a single example, when moving cattle not far from the Palmer River, but, until his conversation with Mr. Neil McGilp, already mentioned, he had thought no more of the matter. Some of the older aborigines around Henbury Station knew of the bird, but could give no advice as to how it could be secured. After I arrived at the Mission Station I began instituting inquiries as to the presence of the bird thereabouts. A clue was at length found in a recently published account of the folk-lore of the Arunta tribe, by the late Rev. C. Strehlow, who spent the best twenty-eight years of his life at Hermannsburg. Amongst the list of birds adopted by the aborigines as totems was the name "Nacht-lichter papagei," which obviously referred to a Night-parrot and not to the various Nightjars which are separately included in the list as well. The native name, Tnokkapaltara, was added in the margin. With the help of this name as an identification, Mr. H. A. Heinrich, who speaks the Arunta dialect fluently, was able to make inquiries of the older and better educated natives, some of whom can read and write in their own language. The Night-parrot was known without a doubt, and, though not often seen nowadays, instances of its recent occurrence were remembered. The head stockman, Mr. C. Paschke, had a few months previously, when driving a mob of cattle over a stony rise, clothed with porcupine, flushed a single bird, but not being specially interested in bird-life, he took but little interest in the circumstance. Some of the aboriginal stockmen recalled flushing an example of the Tnokkapaltara near Mount Waber, a locality some eighteen miles west of the Mission, not so very long ago. Mr. Heinrich himself afterwards remembered the fact of seeing a Parrot with a peculiar flight being driven from its hiding-place by an advancing bush-fire. In further conversation with the natives he learned that the birds tunnelled under the big clumps of *Triodia* where they made lairs, in which they roosted during the day. Further, that the birds were poor fliers in daylight, and could be run down and caught if once driven into the open. When hard pressed, if any porcupine clump was near, and big enough to afford refuge, they dived headlong into the heart of it. The sequel to all this was as follows:—On July 23rd I was camped at Coporyllia Spring, five or six miles west of the Mission. About sunset two small boys came in with a note from Mr. Heinrich, requesting me to come at once, as he had important news to tell me respecting the Night-parrot. I had had a big day, but after tea walked to the Mission by moonlight. It appears that some young boys and girls playing about in the *Triodia*, less than a mile from the Mission, had in a spirit of mischief set fire to the porcupine. During the conflagration a Parrot had been driven out and chased into an isolated clump, when it was again driven out, caught, cooked and eaten. Most unfortunately it was cooked without being plucked. These facts did not come to Mr. Heinrich's knowledge until several days later, but he was at once conducted to the spot by some of the boys who did the mischief. Other adult natives who knew the habits of the Night-parrot accompanied him, and a search was made for the mate of the victim. Tunnels were found with the print of what looked like birds' feet leading into them. These Mr. Heinrich smoothed out, and at once sent me word to come in. Next morning, after my arrival, he and I and some natives went out. The tunnels were shown to me, and there were certainly fresh bird tracks at the entrance. The natives with us were armed with strong "yam sticks," and with these they uprooted and overturned the *Triodia*. In one case we found a small lair, not unlike the nest of the Western Ground Parrot (*Pezoporus wallicus flaviventris*). We searched high and low, and the natives vigorously prodded the adjacent *Triodia* with sticks. We even went so far as to set fire

to a small tract of *Triodia*, but all without success. We could find no mate. I firmly believe the bird exists in small numbers, especially in country not stocked with cattle or horses. It is evidently a shy and solitary species, which resents being disturbed. A number of Loritcha men came to the Mission at the end of June. Their country lies to the west. They were real wild blacks, who had never seen a white man before. Two were persuaded to remain at the Mission. Some of the Mission blacks understood the Loritcha dialect, and questioned them. They knew the Tnokkapaltara, and pointed west when asked where it occurred. At present I think the best chance to get the bird would be to ride with the stockmen when moving mobs of cattle, or to be present when tracts of porcupine are being burnt off. The Horn Expedition undoubtedly secured very tangible evidence of the occurrence of the Night-Parrot near Alice Springs thirty years ago. At that time it appears to have been by no means rare. Perhaps the increase of dingoes, due to the abundance of rabbits, may have had something to do with its present scarcity.

[Whatever may be said to the contrary, cats (domestic gone wild) are accountable for the disappearance of this rare species in some quarters. I am informed by Mr. Alfred Walker that when he was managing Innamincka Cattle Station on Cooper's Creek the Parrots were there in the "eighties." The birds disappeared after an invasion of cats which came from New South Wales. He recollects the last Night-parrot he saw was in 1885. Strange to say, in turn, an epidemic broke out among the cats, which fared badly. More about Cats! G. A. Keartland wrote ("Horn Expedition—Aves," p. 110):—"In one of the operator's rooms (telegraph station) several picture frames were covered with wings and tails of the Porcupine Parrot (*Geopsittacus occidentalis*) which had been caught by a cat last summer." The coloured plate (No. 40) is taken from a drawing by Neville W. Cayley from specimens in the Australian Museum, Sydney, collected in the Gawler Ranges, S.A., probably by the late F. W. Andrews.]

Podargus strigoides. Tawny Frogmouth (Renga).—The moaning notes of the Frogmouth were often heard at our various camps. On moonlight nights I several times tried to secure a specimen, but never had a chance. None was seen at rest in daylight. A nest containing two typical eggs was brought into the Mission by a lubra.

†*Ægotheles cristata*. Owlet Nightjar (Urturta).—Fairly distributed over the country where Eucalypts were plentiful; very often heard calling at night, and occasionally in the day time.

Halcyon pyrrhopygius. Red-backed Kingfisher (Palkanga).—Pairs seen in many places, but no attempt was made to locate nests. No doubt the species bred. In the Palm Valley a pair lived near my camp. On one occasion I noticed the female fly into an adjacent Gum-tree. She was gripping a lizard in her bill. The lizard was longer than herself. I was interested to see how it was to be disposed of. After being beaten against the limb on which she was sitting, it was swallowed, with many contortions, head foremost. When no more could be got down, about three inches of the victim's tail protruded from the Kingfisher's bill.

Merops ornatus. Bee-eater or Rainbow-bird.—A migratory species, none appearing till late in August. In September and October it became very common, and was breeding in many places by the Finke and in the Palm Valley. At Boggy waterhole I found myself camped almost on top of a nesting tunnel. The entrance was in a little creek, within five feet of where I was quietly skinning birds. The owners went in and out, regardless of my presence.

Eurostopodus guttatus. Spotted Nightjar (Coota Coota).—Heard calling at night in the Palm Valley, and also at several of our camps overlooking the great Missionary Plain. At Coporyllia I flushed one from the *Triodia*, but it flew into a deep ravine and I could not find it again. An egg was found under the shelter of a large bush at the western end of the Palm Valley, and another on the low hills near the Hermannsburg. Both were found early in October, and were quite fresh. Mr. Raggatt, of Glen Helen Station, north of the Mission, told me he had often flushed this bird, and seen its egg when riding around his run. The notes heard at night were certainly of a remarkable character, and were only equalled in peculiarity by those of the Swamp Coucal.

Cuculus pallidus. Pallid Cuckoo.—An uncommon bird. A pair or two were seen during the breeding season around Gilbert Springs. It also occurred very sparingly in the Palm Valley.

Mesocalius osculans. Black-eared Cuckoo.—Seen and heard only in the Palm Valley.

Chalcococcyx basalis. Narrow-billed Bronze-Cuckoo.—Cuckoos of any kind were rare this season in Central Australia. This was perhaps due to the dry conditions prevailing. The present species is the only one of which I have direct evidence of breeding. A nest of the White-winged Wren (*Malurus cyanotus* = *leuconotus*) was found containing four eggs, one of which was that of a Bronze-Cuckoo. In pulling to pieces a last season's nest of an Emu-wren, a Cuckoo's egg was found, intact, in the lining.

Hirundo neoxena. Welcome Swallow (Ninjarkua).—A rare bird in Central Australia. Perhaps this was due to the dry season, and was thus exceptional. None was seen until our arrival at Hamilton bore on the return journey.

Cheramœca leucosternum. White-backed Swallow.—A common bird by the Finke and the larger creeks, where pools of water existed. It was present in the Palm Valley too, nesting in the banks of small creeks joining the main one.

Hylochelidon nigricans. Tree-martin.—Occasionally seen flying over pools in the Upper Finke River; somewhat a rare bird.

Hylochelidon ariel. Fairy Martin.—Breeding colonies were noted amongst the cliffs of the Palm Valley. Old birds were feeding young during the middle of October.

†*Petroica goodenovii*. Red-capped Robin.—Pairs were scattered all over the Mulga country. No doubt, they were breeding, but only one nest was observed; it contained a single egg.

[Male more red on crown and throat than is typical. Female is very distinctive with a flushed crown and breast not usually seen in that sex.]

†*Melanodryas cucullata*. Hooded Robin.—In the winter months this species was common, but apparently a good number of the local birds left for the south on the advent of spring. Several nests were observed, but only two eggs were obtained, and these met with an accident.

Rhipidura leucophrys. Black and White Fantail (Titgiritgira).—This remarkable bird, which seems able to adapt itself to all conditions of climate and surroundings in Australia, was found everywhere. It was breeding in August and September. In the Palm Valley a pair hatched out a brood within a few feet of my tent door. Any Crow or Hawk venturing near was at once buffeted and chased away, the Fantails always hovering just above the intruder. The young left the nest in about twelve days. I saw nothing of the *Rhipidura albicauda* of the Horn Expedition, though I was constantly on the look-out for it.

†*Pachycephala rufiventris*. Rufous-breasted Whistler.—This well-known species was confined to tea-tree thickets or to tracts of

dense Mulga scrub. Its joyous song was heard in many places, notably at Coporyllia Spring, and in the Palm Valley. Only one nest was found. Males in immature plumage were heard singing as freely as adult birds. Many males were watched at close quarters with the aid of a field-glass. None was found in a similar plumage to a certain pair obtained on the Nullarbor Plain two years ago. I am of opinion there is something to be cleared up concerning the Rufous Whistler. It is possible there are two closely allied species whose ranges overlap.

†*Coiluricincla rufiventris*. Rufous Shrike-thrush.—A fairly common bird, favouring country where there were thickets of tea-tree scrub, at the mouths of rocky gorges. No nests were observed.

Grallina cyanoleuca. Magpie-lark, Mud-lark (*Pattantdiatcha*).—A common bird wherever pools of water were to be found. Even in Oodnadatta it was present. A pair resided in the Eucalypts surrounding Mr. F. Jones's house. They reared two broods during the present season. At Blood's Creek we camped for one night beside a nice pool of water. There was a flock of over twenty of these birds there. Nests were observed along the Finke and in the Palm Valley.

†*Oreoica gutturalis*. Crested Bellbird (*Kunbalunkala*).—Fairly common wherever trees or large bushes afforded it sufficient shelter. It was numerous amongst the large Witchity bushes in the Palm Valley. Several nests were found. Two were placed very low in tea-tree scrub in the bed of a large creek.

Pteropodocys maxima. Ground Cuckoo-Shrike.—Rather rare. A pair were probably breeding in a large tract of river gums near the fifteen-mile stockyard north of the Mission. Pairs were noted at intervals after leaving Henbury on the homeward journey, but once out of the Finke River valley no more were seen or heard.

Graucalus novæ-hollandiæ. Black-faced Cuckoo-Shrike.—A widely distributed bird in timbered country, but favouring rivers and creeks well lined with eucalypts. Only one nest was seen. It was placed as usual in a fork near the end of a horizontal branch of a gum tree.

Campophaga tricolor. White-shouldered Caterpillar-eater.—A few seen on the Great Missionary Plain, and also in the Palm Valley. The males were not so full of song, as is generally the case in the West. No nests were seen.

Cinclosoma castanonotum. Chestnut-backed Ground-bird.—This species is said to have been obtained by the Horn Expedition near Deering Creek, and a second one seen near Hermannsburg. The latter record may be correct. The country is now too dry.

†*Cinclosoma cinnamomeum*. Cinnamon Ground-bird.—On the outward journey I rode the rear-most camel of the string, and no doubt missed seeing a few birds in consequence. It could not be helped, as I did not know which track to follow, as bullock tracks leading in all directions were frequent. On the return journey I took the lead. It was not till we were a few miles south of Horseshoe Bend that I noted the Cinnamon Ground-bird. There was a party of seven or eight just where the country opened out into a stony plain. Houssian jumped down and gave chase. He secured two, both birds of the year. Further on, other chances presented themselves, and two adult males were procured just north of the Stevenson Creek. The last party was seen a few miles north of Oodnadatta. With this species there seems to be a tendency to unite families into small parties when the breeding season is over; a habit I have not observed with other members of the genus.

†*Pomatostomus rubeculus*. Red-breasted Babbler (*Toagata*).—Chiefly confined to the neighbourhood of rivers and creeks, where it builds its bulky nest in the Eucalypts. It was common throughout

the expedition, especially near the Finke River. Nests were noted thirty feet from the ground. As a rule three or four nests were in the same tree. Eggs were obtained.

†*Pomatostomus superciliosus*. White-browed Babbler. — Seen throughout the expedition right up to the great Missionary Plain, but gradually thinning out in numbers the further north we got. Nests with eggs were found.

†*Epthianura tricolor*. Crimson Chat.—Seen as a migrant in various places, notably in company with Masked Wood-Swallows. Houssian who went to Alice Springs for stores, reported a number seen in some saltbush country. No nests were observed.

Ashbyia lovensis. Gibber-bird.—Seen only in the desolate gibber country. The second day out from Oodnadatta on 20th March a pair were observed building a nest between two stones. Nothing more was seen of the species until the return journey, when one was seen near Wire Creek Bore, and others again nearer Oodnadatta.

†*Acanthiza pyrrhopygia consobrina*. Pale Thornbill.—Thinly distributed through Mulga country. I first met with this species near Boggy Pool on the Finke River. But as no serious attempt at collecting had been made previously, no doubt its range extends much further south. Nests were found on the great Missionary Plain. The eggs in one nest were spotless. [*A. pyrrhopygia consobrina* is darker on flanks and under tail-coverts than typical.]

†*Acanthiza uropygialis*. Chestnut-tailed Thornbill.—Rather a scarce bird, but found along with *A. apicalis* in Mulga (Acacia) country on the Missionary Plain and around Boggy Pool on the Finke. Eggs were found in a cavity of a dead trunk, but they were on the point of hatching. [*A. u. condora* is the lightest or pallid race of this species in the interior.]

†*Acanthiza robustirostris*. Thick-billed Thornbill.—At the Five Mile well, amongst the big Mulgas, were found several species of *Acanthiza*. Breeding operations were just commencing when I visited the locality for the last time. Amongst other specimens collected was one with dark upper tail coverts and a very faintly striated head. I made a note of the fact on the label attached to the skin; but at the time it did not occur to me that I had met my old Lake Austin friend in Central Australia, the striations on the head being so undefined. I have to thank Mr. A. J. Campbell for identifying this little bird, whose range is now considerably extended. ["Adult female. Taken near Hermannsburg Range, 9/8/23; irides buff; bill and legs black." Captain S. A. White and Mr. G. M. Mathews have both renamed this bird from the Everard Ranges. But there appears little or no difference in it, compared with type-locality specimens.]

†*Geobasileus chrysorrheus*. Yellow-tailed Thornbill.—First met with at Boggy Pool on the Finke, but parties were seen on the return journey much farther south. I was at once struck with the brightness of the coloration of these Central Australian specimens, in comparison with Western examples. In view of this fact, A. W. Milligan seems justified in making a sub-species of the latter, which he named. Typical nests were found in the Palm Valley, usually suspended from the pendulous branches of Bloodwood Eucalypts, but occasionally from bunches of Mistletoe. [A fine series; probably *G. c. ferdinandi*, Mathews, Bull., Brit. Orn. Club, XVIII., p. 90.]

†*Smicrornis flavescens*. Yellow Weebill (Tree-tit).—A common little bird in the Mallee, and amongst the Eucalypts along the rivers and creeks. Several nests were found, but only one egg was obtained.

†*Gerygone culicivora*. Southern Warbler (Flyeater).—First met with at Boggy Pool, but others seen on the Missionary Plain and in the Palm Valley during May. When the breeding season arrived, these little birds seemed to be absent. Perhaps Central Aus-

tralia is their winter quarters. [A good series. Specimens have less white on tail and smaller wings than some western birds; irides pale, not bright red. The species was first collected in Western Australia, the types of *Psilopus culicivorus*, Gould, being in the Academy of Natural Science of Philadelphia (*vide Austral Avian Record*, I., p. 156). The central birds range in tone of general upper surface, from drab to buffy brown. Those in the latter (darker) colour are probably immature.]

†*Acrocephalus australis*. Australian Reed-Warbler.—A few were seen and heard in the reedy margins of the Finke River, where it cuts through the James Ranges. The first bird was heard singing in a small patch of reeds growing around a pool in the Palm Valley. After leaving the latter locality we followed the Finke down until we cut the main camel track above Boggy Pool. Wherever there were pools of water margined by tall reeds, there I heard the Reed-Warblers singing. We camped two days at Boggy Pool to investigate. After a hard morning's work in the water and reeds, we secured two males. Houssian also found an empty nest; but I could not be sure whether it had contained young or not. This was on 21st October, and very late for the nesting of Passerine birds. Owing to the wind and the height of the reeds, which exceeded ten feet, and were very dense, we could do no more. At the Hamilton Bore, seventy-five miles north of Oodnadatta, Reed-Warblers were singing in cover growing in the large overflow pool. One was taken. [Three males, wing average of the species—70 mm., but specimens are much lighter than typical from either east or west, the general upper surface being Saccardo's umber, not raw umber, as in the others.]

Megalurus gramineus. Little Grass-bird.—Whilst hunting the Reed-Warblers I observed a small bird creeping about the foot of the reeds near the water's edge. I called to Houssian, who was further in the water than I was, to shoot at it. He was lucky enough to make a successful shot, and after a swim retrieved the bird. It proved to be a heavily marked "*Megalurus*." A second bird was seen, but not secured. At one reedbed I heard feeble notes like those I became familiar with on the Fortescue River last year. I suspected the presence of a Fantail Warbler (*Cisticola*). I exhausted every artifice to make them show up, but without success. There was too much wind blowing.

Cinclorhamphus mathewsi. Rufous Song-Lark.—A rare bird. One or two heard singing near our camp in the Palm Valley, in the months of September and October.

†*Eremiornis carteri*. Spinifex or Desert-bird.—The occurrence of this species in Central Australia, hitherto supposed to be strictly confined to the north-west of the continent, was one of the surprises of the expedition. I first suspected its presence when hunting for Emu-wrens near the entrance to the Glen of Palms. I had followed up a creek where the *Triodia* was growing thickly in large clumps, when I was startled by thinking I heard the well-known call-note. It was not repeated, however, but I did get a glimpse of a brown bird dropping down into the *Triodia* in a suspicious manner. After this I was on the *qui vive*. A few days later, on our return to the Palm Valley, as I was investigating the summit of a hill, thickly covered with *Triodia*, I thought I heard the note again, but at some distance away. I followed up the clue without success. If the Spinifex-bird was there, it had evidently not yet begun to call. This was in the month of May and June. It was not till I camped at Coporyllia Spring a little later on that I cleared the matter up. I was hunting the *Triodia* for traces of the Night-parrot, when I again heard the call-note, this time unmistakable. I cautiously walked to the spot from which the sound appeared to

NATIONAL GUSTUS MELHIGNE



Nest of Thick-billed Grass-wren in Cane-grass.

Photo. by F. Lawson Whitlock, R.A.O.U.

come, and imitating certain other notes of the species, tempted the bird to show itself. It was a true example of *Eremiornis carteri*—an adult bird. A younger bird was afterwards secured. Occasionally a glimpse was caught of other individuals, but the species was evidently very local and present only in small numbers. During a journey in company with Mr. Heinrich, of the Mission, examples were seen between the Gilbert Springs and Gosse Ranges, over thirty miles west of the Mission. In the early part of September, whilst hunting for nests of Grass-wrens in the blue porcupine (*Triodia irritans*), near Coporyllia Spring, I surprised a pair. I made four attempts to locate the nest, but am inclined to think they had young in the porcupine. Last of all, during my final visit to the Palm Valley in October, I had followed a deep creek, where the Soft *Triodia* was fully six feet in height to the top of the flower stalks, when I heard two *Spinifex*-birds calling continually. There had been a little rain the previous night. I saw both these birds distinctly, but had brought no gun with me, as I had much rough climbing to do that particular morning. This was the last encounter I had with the *Spinifex*-bird in Central Australia.

[This is another "locality record." There is a good and serviceable series of the *Spinifex* or Desert-bird in the "H. L. White Collection," from North-west Australia, including Barrow Island and now from Central Australia, the last specimen having been taken earlier in the season in fine feather. The type of *Eremiornis carteri* was procured 1250 miles westward in the same latitude (Point Cloates), while the nearest previous record was Mt. Huxley, Kimberley, about 650 miles to the north-west from the Macdonnells, which is probably the eastern limit of the species. Specimens from the near North-west (Point Cloates) and far North-west (Kimberley), according to Herbert (*Nov. Zool. XII.*, p. 226) "agree perfectly." One of the peculiarities of modern work is that any person may name a specimen sub-specifically, whether it be a sub-species or not, just because it is from a new locality.]

†*Amytornis modesta*. Thick-billed Grass-Wren.—This is another Grass-Wren that has recently been recognised as worthy of full specific rank. As far as my memory goes, it is in life a more robust and thick-set species than *A. textilis*, to which, however, it is closely related. In Central Australia its neighbour and congener, *A. purnelli*, can at once be distinguished from it by its much more slender bill, by the more rufous coloration of the upper parts, and generally lighter build. I never found the two species living in the same area. When I made its acquaintance near the Hermannsburg Mission, I provisionally called it the Cane Grass-Wren, from the nature of the cover forming its favourite haunts. It is not, however, confined to the Cane Grass (*Spinifex paradoxus*), but I found it in small numbers some five or six miles east of the Mission, in undulatory country clothed with soft spinifex (*Triodia pungens*) and a little Mallee. Here it was more difficult to watch, and I rarely saw it except when it was feeding on the margins of the *Triodia*. About three miles north of the Mission, the Finke divides into two channels; these unite again at the Mission itself. The intervening country forms a long narrow flat, abundantly clothed with flourishing clumps of Cane Grass, with a few much-eaten salt-bushes, bearing a pink berry. At flood time this flat is much scoured by the waters of the Finke. Each clump of Cane Grass thus forms a little islet raised above the surrounding sand. It is in this country that the present species finds a home, and builds its nest. My first encounter with it was on returning from Coporyllia Spring. I could see the birds hopping at great speed from cover to cover when riding through its haunts on a camel. Houssian jumped down, and after some trouble obtained a pair. I

was at once struck by the stout conical bill and general thick-set appearance of these birds. This was in striking contrast to the same features in the case of *A. purnelli*. There was not the slightest doubt that the two species were quite distinct. I paid several visits to this big flat, and saw much of the Grass-Wrens. They were shy if followed too persistently, but were rather inquisitive. I drove pairs on several occasions to the shelter of masses of flood debris, and by patiently standing quite still some fifteen yards away was rewarded by both birds hopping into full view to take a peep at me. On one occasion a female bird hopped to the top of a fairly large Acacia bush, from which it eventually flew to the ground. I may here state that *A. modesta* takes more readily to the wing than any other member of the genus with which I am acquainted. I found this Grass-Wren a silent species. This is a general characteristic of the *A. textilis* group. The only note I know is a high-pitched alarm note, which Houssian aptly described as similar to the sound emitted by a bicycle pump when inflating a tyre. The breeding season commences early in August, odd pairs perhaps building before the end of July. I was passing through the haunt on August 18th, when I observed a Grass-Wren slip out of a clump of Cane Grass about forty yards away. I walked over to the spot, and in a few minutes found a fully-domed nest containing three fresh eggs. Further search revealed a second nest with three young birds a week or so old. This was a half-domed nest. I lifted one young bird out. It uttered its high-pitched alarm note, and the female came hopping up almost to my feet. The plumage of this nestling was not advanced enough to merit description. When I visited the nest again the three young had departed. At intervals during August and September I was able to make a thorough search of the whole flat, and found a number of occupied nests and still more old nests of previous seasons. They were of three types, viz., fully-domed, half-domed, and cup-shaped; the half-domed were the most numerous. All were placed low down, some were resting on the sand forming the little hillocks on which the Cane Grass was growing. Others were raised a few inches in the dense growths of Cane Grass. Not infrequently I found both new and old nests in the saltbushes which were much eaten down by the Mission cattle. As an exception, I found a fully domed nest in a dense prickly bush. This nest contained four eggs, but they were obviously the production of two females. One pair was stale. Another nest was cleverly concealed in a mass of flood debris, and would have easily escaped observation had not the female flown off. It contained two young birds. Some nests were easily seen. A cup-shaped nest in a straggling saltbush had no concealment whatever, the eggs being plainly visible. The female is a close sitter. I could walk very quietly in the sandy ground, and on one occasion so startled a sitting bird that she damaged one of her eggs in her haste to leave her nest and get down an adjacent rabbit hole. The domed nests were rather loosely made, outwardly of Cane Grass stems, but lined with finer grasses. The half-domed nests, too, were rather loose; but neatly lined with fine grasses and occasionally a little fur. One cup-shaped nest contained a few parrot feathers. The eggs varied in number. Three was the largest clutch, but two eggs was the more general rule. One or two nests contained but one young bird. In character the eggs were less blotchy than those of *A. textilis gigantura*, which I have found on the East Murchison, and also than eggs of *A. textilis*, judging from the fragments of eggs found in nests on Peron Peninsula (W.A.). The food of the Thick-billed Grass-Wren is chiefly of a vegetable character; small berries and fairly large seeds being eaten, but it also feeds on small beetles and other insect life. In the report of

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The half-domed Nest of the Dark Grass-wren in Porcupine-grass

Photo by F. L. Whitlock, R.A.O.U.

the Horn Expedition, the Striated Grass-Wren (*A. striata*) was reported as common near Hermannsburg, and *A. textilis* as common near Stokes' Pass. I think a transposition of notes has here crept in, as the birds we now distinguish as *A. purnelli* and *A. modesta* are in a reversed position as regards these localities. In view of Gould's description of *A. striata*, the late Mr. A. J. North would not be likely to have made the mistake of calling *A. modesta* *A. striata* nor *A. purnelli*, with its rufous mantle, *A. textilis*. The name *striata*, though appropriate enough when bestowed on a Grass-Wren, has proved an unfortunate selection. Striations are common to the whole genus, and form a striking feature in the plumage of its members. The name is not distinctive enough, and has led to frequent mistakes in identification. In both *A. modesta* and *A. purnelli*, the rule that females should be distinguished by rufous flanks is followed. Unfortunately, I did not see nestlings sufficiently advanced in plumage to be able to describe them, but I have little doubt they will be found to resemble the female in this respect; the rufous coloration, however, being of a much duller tint. The last individuals of the present species, seen during the expedition, were observed near "Old Crown" Station on the Finke River, on the return journey, at the end of October. [There are coloured figures in *The Emu* (vol. xx., pl. 20) of *Amytornis textilis* from Shark Bay, W.A., type locality. In the letterpress connected therewith (p. 190), Mr. H. L. White asks the interesting question—"What bird is figured by Gould in his plate (No. 28, Birds of Australia, vol. iii.), as *textilis*? Mr. White now answers the question himself through the material his collector, Mr. Whitlock, has procured. The material consists of a fine series of *A. modesta*, North, which perfectly agrees with Gould's plate. Examples of similar birds from the interior of New South Wales are also referable to *A. modesta*, and, as Gould's examples came from that province, there can be little doubt that his *textilis* is North's *modesta*, which differs specifically from the true *textilis* of Quoy and Gaimard in having *no streaks on the lower back or on the under surface*. Under these circumstances it would appear that G. M. Mathews' *A. inexpectata*, as a species, falls to the ground, notwithstanding he has so materially aided to unravel a most difficult genus. Specimens of *A. modesta*, North, both from New South Wales and Central Australia, were obligingly lent for examination by the Australian Museum, Sydney.]

†*Amytornis purnelli*. Dark Grass-Wren.—This Grass-Wren, first described as a sub-species of *A. textilis*, came under my notice in the beautiful Palm Valley. Whilst I was busy with the camera at the entrance of a narrow ravine, I handed the .410 bore to Houssian. He was watching some Bower-birds hopping about the branches of a wild fig-tree growing near the summit of the cliff. Hearing a rustling in some scrub close at hand, his attention was attracted by the sight of a Wren-like bird. He fired at it on chance, and after some trouble found the bird amongst the dead herbage at the foot of the scrub. On my return he handed it to me, informing me that another bird like it was hidden amongst the rocks just ahead. At first glance I thought I was looking at a variety of the Striated Grass-Wren (*A. striata*), and I could see it differed from a typical Rufous Grass-Wren (*A. whitei*) in being much less rufous, but at the same time its affinity did not appear to be with any known member of the *A. textilis* group. Though I searched for some time I did not see the second bird. It was reasonable to suppose, however, that other pairs lived in similar surroundings. This proved to be the case, for at a certain spot on the Finke River, where there were high cliffs, much encumbered by fallen rocks, and clothed with clumps of *Triodia*, several other specimens were observed. Though

the haunts of the present species are similar to those of *A. whitei*, [The Horn expedition obtained a specimen of *A. whitei* (= *rufa*), at Haast's Bluff, north of James' Range. The specimen is in the National Museum, Melbourne, A.J.C.] I soon noticed one striking difference in the habits of the two species. *A. purnelli* lacks the sweet rippling song of *A. whitei*. True, the former twitters in an excited manner when disturbed, but the notes are high-pitched, and I found them difficult to detect when uttered at any distance. Houssian, however, who possessed acute powers of hearing, could locate the birds on the far side of a large creek at a distance of thirty yards, where we were camped in the Macdonnell Ranges. In this absence of song the nearer relationship of *A. purnelli* to species of the *A. textilis* group was apparent. The character of the nest and eggs, however, showed this relationship still more plainly. I was inclined to expect eggs of a type intermediate between those of *A. striata* and *A. textilis*, laid in a nest like that built by the former. In neither respect were my expectations realised. For, of a number of nests found, all were semi-domed, the entrance being larger and lower down than in typical nests of *A. whitei* or again in those of *A. oweni* (Mathews), found by myself in 1908 on the East Murchison (W.A.). The eggs were, generally speaking, smaller than those of its near neighbour, *A. modesta*, which is the representative of the *A. textilis* group in Central Australia; but in coloration and character of the markings they were very like eggs of the latter. I never found *A. purnelli* away from the rocky gorges of the ranges or from their steep stony slopes. All the nests found were either in clumps of *Triodia* or in dead bushes surrounded by growths of this prickly grass. None was at a greater height than eighteen inches, and as a rule they were fairly well concealed. One containing a single newly-hatched young bird was found only by flushing the female from the nest a second time, so cunningly was it concealed. A nest, however, of the previous season, belonging possibly to the same pairs of birds, was visible at a distance of twenty yards, to anyone looking for it and possessed of sharp eyes. Several nests were found on the summits of the lower hills, but the favourite place was the rocky sides of a gorge or ravine, clothed with clumps of *Triodia*. The female, once incubation is commenced; is a close sitter, and only dashes off the nest when danger is imminent. In the case of a nest photographed, the flower stems of the *Triodia* bush in which it was built had to be broken away to get a clear view, and the nest itself opened out a little to render the eggs visible. The breeding season commences about three weeks later than that of its neighbour—*A. modesta*. The first nest, with two slightly incubated eggs, was found September 3rd. Others with fresh eggs or young were found during this month. Nest-building, therefore, commences about the middle of August. Young were on the wing in October, or rather out of the nest, for this Grass-Wren does but little flying; not from want of ability, but rather from lack of desire. The food of *A. purnelli* is largely of a vegetable nature. One specimen taken in the Macdonnell Ranges had been feeding on the fruit of the wild fig; but the stomachs of others contained grit, remains of very small beetles and seeds of various unidentified plants. [Mr. Whitlock secured a fine series of this and the preceding species, most carefully prepared and sexed; indeed, the same applies to all specimens collected during the expedition.]

Amytornis goyderi. Goyder Grass-Wren.—I regret I cannot give any precise information about this little-known species. None but the types has been procured.* These were obtained on the Macumba River many years ago. The Macumba River extends to

*Vide *Emu ante*, p. 81.

within a few miles of the north of Oodnadatta. The camel track north crosses the river. On November 5th we were travelling over the run, some forty miles from Oodnadatta, on the return journey. Conditions were bad. A remarkably cold wind was blowing half a gale in our faces, and the air was full of particles of flying dust. In passing over the slope of a low hill clothed with saltbush, and isolated masses of low dead scrub, I observed two Grass-Wrens. I immediately called a halt, and both Houssian and I jumped down and gave chase. The birds were very wild, and owing to the wind and dust we soon lost sight of them without getting the chance of a shot. We could not camp, as there was no camel feed, and they were in need of water. The night before we had been smothered with dust, and could hardly eat any food in consequence. Under the circumstances I had reluctantly to give the order to move on. I cannot say with any certainty at all to what species of Grass-Wren this pair should be referred, but no others had been seen since leaving the Finke.

†*Stipiturus ruficeps*. Rufous-crowned Emu-wren. — On paying a visit to the Glen of Palms in the Finke River, in company with Mr. M. Kleinig, of the Mission, he and I, taking our cameras with us, went up the gorge, and left Houssian at the entrance to keep his eye on the camels. I handed the .22 bore gun and ammunition to him. Hearing a twittering in the *Triodia* clothing the hillside, he investigated the origin of the sounds. He was successful in locating the songster, and shot a male Emu-wren. On our return from the interior of the Glen of Palms, he handed the bird to me. I was delighted to recognise the lesser Emu-wren. I at once went up the hillside myself, which was an ideal spot, being clothed with numerous clumps of Soft *Triodia* (*T. pungens*), amongst which small shrubs were growing. I failed, however, to get a second specimen. Afterwards the species was found in several other localities of a similar character; and at Coporyllia Spring it was also found in the blue porcupine (*Triodia irritans*). Nests were found near the Mission, and also in the Finke Valley, where it cuts through the James Ranges, but only two contained eggs—a pair in each case. The nests were placed amongst the flower stalks springing from the summit of a clump of *Triodia*; but in one instance the walls were woven around some twigs of a dead shrub. Unlike nests of *Maluri*, few spiders' webs were used to bind the structure together, which was cunningly woven of the finest grasses.

[Some years ago the late Dr. Angove, of Adelaide, possessed a single specimen of *Stipiturus ruficeps* from Central Australia, and on that evidence the locality was recorded in the R.A.O.U. Check-list. By the fine series of specimens obtained by Mr. Whitlock, it is interesting to have Central Australia as a habitat of the species confirmed.]

†*Malurus callainus*. Turquoise Wren (Ljirraljirra).—The Horn Expedition did not find this species in Central Australia, but the report refers to the Black-backed Wren (*M. melanotus*). I believe the late A. J. North is responsible for the identification of the birds collected by the expedition. I had no experience previously with either species, but I have the authority of Mr. A. J. Campbell for the identification of the *Maluri* collected on the expedition and have full confidence in his judgment. I was greatly struck by the appearance of this bird. It certainly equals, if it does not even surpass in beauty and brilliance of plumage the Splendid Wren (*M. splendens*), of the West. In Central Australia its haunts are tracts of big Mulga (*Acacia aneura*) and other scrubs, where the tree-like bushes grow fairly close together. Over such country it is found in thinly scattered parties. In the Palm Valley, it was

found near our various camps. For some reason or other, the *Maluri* in Central Australia are late in assuming nuptial plumage, and with one exception males were not observed in full livery before August. In corresponding latitudes in the West I have seen males in full plumage regularly in May. These remarks apply equally to the next species, *M. cyanotus* (= *leuconotus*). Parties of *M. callainus* were at once distinguishable from other *Maluri*, by the bright blue tint of their tails, and the blue margins of the flight feathers. The tail, too, appeared to be both broader and shorter in proportion to the body. I was very anxious to find nests of this *Malurus*, but it was not until my second visit to the Palm Valley that I was successful. On 25th September, I located the first nest, which was placed very low down, and without any attempt at concealment, near the trunk of a dead tree-like bush. The nest was supported by a piece of half-detached bark. I had observed a pair of *M. callainus* near the spot for several days. The nest contained one egg. Returning to the spot a few days later, I found the nest disturbed, and a second egg laid on a thick horizontal branch nearby. Another nest was found in a prickly *Hakea* bush (*Hakea terminalis*). It was about five feet from the ground, and was just completed. Two eggs were eventually laid, but, to my great regret, on visiting the nest the following day, I found it had been destroyed, possibly by a Crow or a lizard. A third nest was in a remarkable situation. I had followed up a pair of *M. callainus* feeding in a little creek amongst the big Witchity bushes, but eventually lost sight of them. In passing a prickly *Hakea* a bird flew from the nest of a *Taeniopygia castanotis* (Chestnut-eared Finch). As it disappeared into a neighbouring bush, it struck me as being un-finch-like in flight. I sat down. Presently a lovely male *M. callainus* appeared, hopping about within a few feet of where I sat. Soon afterwards his mate arrived, and after some hesitation hopped from branch to branch of the *Hakea*, and finally disappeared into the Finch's nest. Further examination revealed the fact that the Finch's nest had been relined throughout with fine grasses and fur, and thus adapted as a breeding place for the *Malurus*. The nest contained two typical eggs. It was placed about six feet from the ground. There were other Finch nests in the same bush. I noticed that fully adult females of this species lack the conspicuous blue margins to the wing feathers possessed by younger birds.

[Some ornithologists contend that *M. callainus* and *M. melanotus* are sub-specific varieties of each other. In *M. callainus* the forehead and crown are light cerulean or light methyl blue, many tones lighter than the throat and foreneck, which are a purplish ultramarine or "smalt" blue. In *M. melanotus*, both regions (forehead and crown and throat and foreneck) are invariably the same colour, i.e., the dark (smalt) blue. This test is always true, therefore the two birds may be consistently separated.]

†*Malurus cyanotus* (= *leuconotus*). White-winged Wren.—This Wren was found on the Finke flats, and also amongst the *Triodia* growing on the slopes, and in the little valleys of the James Ranges. But the favourite haunt was in the occasional large areas of Cane-grass (*Spinifex paradoxus*), interspersed with salt bushes. A few miles north of the Mission the Finke River divides into two channels, which unite again just south of the homestead. The intervening flat was the favourite haunt of the present species, and also of the Thick-billed Grass-wren (*Amytornis modestus*). It was thickly clothed with innumerable clumps of Cane-grass, which is not much eaten by stock, when other herbage is present. In hunting for nests of the Grass-wren, I found a few nests of *M. cyanotus*. Some were in the Cane-grass, but the majority were in the remains of Salt-bushes. These Salt-bushes were much eaten

down by the station milking cows, but for all that these little *Maluri* preferred to build their nests amongst what was left than in the denser cover of the Cane-grass. One or two nests were in consequence almost resting on the ground. I found no difference in the material of the nest from that used by this species in Western Australia. This *Malurus* is one of the most widely distributed of the family, and naturally presents some variations in its plumage. I obtained one or two males for comparative purposes, and was interested to find the blue feathers of the back distinctly streaked with white. On carefully examining these individual feathers, I found the basal half was blue and the tip white. This is the nearest approach to a White-backed *Malurus* that I have met with.

†*Malurus assimilis*. Purple-backed Wren.—This was a fairly common species in suitable haunts. It favoured tea-tree thickets in particular, but was often seen amongst tracts of Porcupine-grass, where small bushes were growing. In such surroundings it was even to be found on the tops of the lower hills of the James Ranges. A number of nests was found, but in every case they contained two young birds a day or two old. The nests were most frequently found amongst the flower stems, springing from the top of a clump of Porcupine-grass (*Triodia*).

Artamus personatus. Masked Wood-Swallow.—During the last week of August large numbers of these birds were met with at the foot of the Macdonnell Ranges. They were on migration, and were accompanied as usual by a few Crimson Chats (*Epthianura tricolor*).

†*Artamus cinereus*. Black-faced Wood-Swallow.—This was the local and resident species of Wood-Swallow observed throughout the expedition. It was met with in all suitable haunts, and nests with the usual pretty eggs were found near the Mission. On the return journey, in passing through scrub country, several late nests were observed from which the sitting bird slipped off.

Artamus minor. Little Wood-Swallow.—Seen in the Palm Valley and near cliffs on the north side of the James Ranges. None was observed much before September, showing that in Central Australia the species is migratory. In the Palm Valley, in October, there was much chasing about, but I do not think nesting operations had commenced.

Aphelocephala castaneiventris. Western Whiteface.—Chiefly confined to the large tracts of Mulga and Witchity bushes. Nowhere very common. The aborigines brought in one or two eggs to the Mission. The nests were made in cavities of small dead tree-like bushes, and were masses of rabbit fur. I failed to find the Black-banded Whiteface (*A. nigricincta*) of the Horn Expedition. [Slightly paler on the flanks than typical *A. castaneiventris*. The R.A.O.U. check-list recognises *A. leucopsis* and *A. castaneiventris* as separate species, chiefly on the following grounds:—*A. leucopsis* has the upper surface olive brown; flanks same tone and breast with dull cross-marks on feathers. *A. castaneiventris* has upper surface buffy brown, especially crown and tail-coverts; flanks distinctly tawny and with cross-marks on breast feathers absent. If the above key be applied to the Central Australian bird (there are four specimens), it falls under *castaneiventris* with the earlier of Mathews' two subspecific names, *A. l. pallida*.]

†*Sphenostoma cristatum*. Wedgebill (*Tchutalpa*).—A very local species, favouring the neighbourhood of groups of Corkwood trees. There was a colony at the long water hole, Ellery Creek, and another on the west side of the Finke River, near the fifteen mile stockyard. Odd pairs were found in the Palm Valley. On the return journey, the well-known notes were occasionally heard. A local name for this species was "Wheelbarrow-bird," its notes

being supposed to resemble the squeaking of an ungreased wheel.

†*Neositta pileata*. Black-capped Sittella (Tree Runner).—Only one small party seen. This was at Coporyllia Spring. One was shot. Several of the flight feathers had the orange band replaced partly by white.

†*Climacteris superciliosa*. White-browed Tree-creeper.—First met with on the Missionary Plain, afterwards seen in the big Mulga tracts east of the Homestead and on the road to Alice Springs. A pair shot for comparison with western examples. One difference I noticed in the female was that the rufous stripe over the eye was shorter and less distinct. On the other hand, the white eye-stripe in the male was very clear and distinct.

†*Dicaeum hirundinaceum*. Mistletoe-bird.—Found commonly wherever mistletoe was plentiful, notably in the Palm Valley. In May it was still in moult. Two of its beautiful nests were found. One in a pretty Hakea bush (*Hakea leucoptera*) growing on the top of the lowest ranges. It contained young birds.

†*Pardalotus ornatus*. Red-tipped Pardalote.—Not a common bird, but present amongst the Eucalypts by the Finke River and larger creeks.

†*Pardalotus rubricatus*. Red-browed Pardalote (Narangawonna).—This pretty little bird was common by the Finke and larger creeks, in whose earthy banks it drove its wonderful tunnels. Nests containing eggs were found. [Referable to *P. r. pallidus*. See coloured figure, *Emu*, XXI., pl. 1.]

†*Melithreptus laetior*. Golden-backed Honeyeater.—A few parties were seen here and there along the Finke River and some of the larger creeks. In the Palm Valley two families lived near our camp, and I watched them carefully in the hopes of getting a nest. There was the usual fussing about, accompanied by the loud ringing notes, but no signs of building. In the end, I sacrificed a female. On dissection I found the breeding organs dormant. I am thus confirmed in my opinion that this honeyeater breeds usually after, or during, the summer rains.

†*Myzomela nigra*. Black Honeyeater. — This little Honeyeater seems to be a scarce bird in Central Australia. A few pairs haunted the northern slopes of the James Ranges. I found two nests, each containing two young. I obtained a good negative of one nest.

Glyciphila albifrons. White-fronted Honeyeater.—One or two observed in the Palm Valley during September.

Lacustroica whitei. Grey Honeyeater.—I discovered this bird in the neighbourhood of Lake Austin, W.A., in 1903, but the species was not described or named until after my expedition on behalf of Mr. H. L. White to Lake Way, when I secured other specimens which, together with their tongues, nest and eggs, were sent to the late A. J. North, who then was able to determine the relationship of this obscure little bird to other Australian birds. Since then nothing more was heard of it until Mr. J. W. Mellor, of Adelaide, procured, in 1920, a single specimen near the mouth of the Murchison River in W.A. On our way up country we camped for a few days at Boggy Pool in the Finke River. While I was busy one day preparing specimens, Houssian took the .22 bore to try his luck. He came back with a Warbler (*Gerygone* or Fly-eater), an *Acanthiza* and a Grey Honeyeater. It was certainly a surprise, as other experienced field naturalists had been through the country previously without finding it. Unfortunately, I was taken ill a day or two later, and was laid up for seven or eight days. However, later on, when camped some five miles east of the Mission, I met the species again. I was hunting in a tract of big Mulga and Witchity bushes, when I heard the well remembered notes. I secured several more fine



Nest and Young of the Black Honeyeater (*Myzomela nigra*).

Photo. by F. L. Whitlock, R.A.O.U.

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specimens. No doubt I should have found nests, but was not again in the same neighbourhood during the breeding season. These birds were consorting with Thornbills (*Acanthizae*) in the same way as I had observed them doing in Western Australia. It is now apparent that the species has a very extensive range. I fully recognise Mr. North's difficulty in choosing a name for this soberly clad and unobtrusive species. But *Lacustroica*—a "Lake dweller"—is not in the least appropriate. It has no predilection for lakes or even pools. No doubt, the name was suggested by the localities in which the types were procured. But both these lakes are, as a rule, dry, and the bird is not found within miles of their margins. Some of the specimens submitted to Mr. North were obtained twenty miles from Lake Way. A Latin or Greek name, signifying a Mulga or Scrub dweller, would have been more appropriate, and not misleading as to its haunts. After further observation I can find nothing in its habits confirming Mr. North's opinion that its nearest ally is probably *Myzomela*. In this respect it more resembles a Silvereye (*Zosterops*). [Upper plumage not drab like western specimens, but more hair brown. Difference possibly accounted for by new plumage (date 10/4/23) as against colour of western birds taken 10th and 11th months. Same wing, 61 mm.]

Stigmatops indistincta = *Glyciphila ocellaris*. Brown Honeyeater. — Very common amongst teatree scrub, especially in the Palm Valley. It was in full song, but the only evidence I discovered of its breeding was a fully-fledged nestling. I think this bird, too, in Central Australia, is a summer breeder.

†*Meliphaga virescens*. Singing Honeyeater.—A common bird wherever there was sufficient cover and food to support its existence. It was plentiful on the great Missionary Plain, and also in the Palm Valley. A number of typical nests was observed.

†*Meliphaga plumula*. Yellow-fronted Honeyeater.—Only seen around the Gilbert Springs, some twenty-two miles west of the Mission. It was not breeding in the month of August, though some of its congeners were doing so. Several specimens were secured for identification purposes.

†*Meliphaga keartlandi*. Grey-headed Honeyeater.—Once the James Ranges were reached, this species became very common. It occurred in the Macdonnells too, and was frequent in the isolated Gosse Ranges. A few nests were found. I failed to hear several peculiar notes uttered by this species during the breeding season in the North-western districts of Australia.

Meliphaga penicillata (= *Ptilotis leilavalensis*). Lesser White-plumed Honeyeater.—Mr. A. J. Campbell is responsible for the identification of this very common Honeyeater. I took it to be *P. penicillata*, but I am content to leave the matter in his hands, as he has both the experience and facilities for reference and comparison close at hand. Nests were found in a variety of situations. Like *M. p. carteri* in the West, this bird loves the neighbourhood of water. The aborigines group all numbers of the genus *Meliphaga* (*Ptilotis*) together as "Inbinba."

Myzantha flavigula. Yellow-throated Miner (*Penpira penpira*).—Somewhat local, but common enough where it occurred. It was numerous around Henbury and at the Mission, where it nested during August and September. I saw some beautifully-made nests, the inner cup of the nest being lined with horsehair, with almost geometrical precision.

†*Acanthagenys rufogularis*. Spiny-cheeked Honeyeater (*Aritgalitgala*).—Central Australia is evidently the winter quarters of this species. In the Palm Valley in May and June it was extremely numerous amongst the abundant flowering Mistletoe. In September,

despite there being no lack of Mistletoe, all but a few odd birds had departed. No breeding pairs were found during the expedition.

Anthus australis. Pipit (*Tchilpara tchilpara*).—Scattered pairs seen all over the country explored, but nowhere really plentiful. A nest with eggs was found near the Mission Station. I saw nothing of a *Calamanthus*. In referring to *C. isabellinus* in the Horn Report, North states that specimens were procured near Blood's Creek and Abmingha Creek, and then gives the habitat as the Missionary Plain, which is over 200 miles further north. I intended camping at Abmingha on our return journey, but on arriving there found the creek quite dry.

Mirafraga secunda (?). Bush-lark (*Tchitalaparincha*).—One or two recognised by their peculiar flight, but no specimens were obtained.

Emblema picta. Painted Finch.—Rather a rare bird this present season. Pairs were noted occasionally on the north side of the James Ranges and also in the Macdonnells. In the Palm Valley a pair were seen feeding young ones, fully fledged in September.

Taeniopygia castanotis. Chestnut-eared Finch (*Naenka*).—Abundant everywhere near water, and breeding throughout the period I spent in Central Australia. The favourite nesting place was the large prickly *Hakea* bushes (*H. terminalis*). Some bushes contained as many as twelve nests. As an exceptional nesting place, one pair occupied a cavity in a post-and-rail fence, in the Palm Valley.

Chlamydera guttata. Western Guttated Bower-bird (*Karka*).—Our camp at Boggy Pool on the Finke was a few miles from the old Illamurta Police Station, associated with the name of the late Constable E. C. Cowle, who obtained the first authentic eggs of this species. It was here that I met with the first Bower-bird in Central Australia. Knowing I was in a favourable locality, I kept a sharp look out, not only with eyes, but with ears too (if the latter is possible). I was soon rewarded by hearing the well-known notes in a tree not far from my tent door. I directed Houssian's attention to the sound, and he carefully stalked the bird. It was a fine adult male, not quite over its moult, but in good plumage nevertheless. I was at once struck with its richer coloration, in comparison with birds from the interior of Western Australia. The underparts especially were of a much brighter yellow tint, whilst the lilac feathers surrounding the brilliant pink of the nape actually shaded into a clear distinct blue. Unfortunately, my illness supervened soon after I had skinned this bird, and I saw no more Bower-birds until I visited the Palm Valley in May. On arrival at the Palms it was not long before a playground was found a little more than half-a-mile from camp. It was situated under a large Witchity bush on the eastern side. This playground had an appearance of newness about it, being smaller and less substantial than usual. The materials used in construction were, however, the same as those employed in the West, and the inner lining was the stems of *Triodia* seed sprays. The playthings were much the same as I found in the Hammersley Ranges the preceding season. At one end of the platform flat pieces of white or grey limestone, at the other end bones of rabbits, rock wallabies and Euros. In the archway itself were prickly green seed vessels of a plant belonging to the castor oil family, also seed pods of an *Acacia*, and green galls from some other bush in the neighbourhood. There was a strong party of birds attached to this playground; often five birds were in the sheltering bush, whilst others could be heard in a teatree thicket near at hand. The performance was of the usual character, an excited bird with puffed out feathers at either end of the inverted arch, apparently disputing over the seed-vessels and other objects lying between. Most perfect imitations of the notes and calls of other birds were uttered at the same time. I photographed this bower. To do so



Male Bower-bird at Playground.

Bower decorated with Kangaroo bones and nuts of a Cycad.

Photo by F. L. Whitlock, R.A.O.U.

1 NATIONAL MUSEUM MEMPHIS

I had to chop out an intervening branch, which obstructed the view. This did not interfere in the least with the playground itself, yet the birds resented the matter. Revisiting the place eight days later in company with Mr. Kleinig, of the Mission Station, I was astonished to find the whole structure had been removed to the western side of the bush, where an older playground had formerly existed. Had I known what was going on, I should have been greatly interested in watching the process of removal and reconstruction. I missed a splendid chance. A little later another playground was found to the east of our camp. Like the first one, this, too, was constructed under a very large and half dead Witchity bush. It was a substantial affair, and some of the bones were large and heavy for so small a bird to carry to the playground. As in the other case, the flat stones were at one end, and the fragments of bones, seed-vessels, etc., were at the other. Green galls chiefly occupied the centre of the inverted arch. Five birds were attached to this playground—two fine old pairs and a younger unmated male. I photographed this playground too. To get a good view was easy, and I had to break off only one or two small twigs. This did not seem to disturb the owners. Yet a month later they removed everything to the further side of the bush. I was most careful not to disturb them, and forbade a shot to be fired near the spot. I can only conjecture that Bower-birds take a pleasure in erecting these playgrounds, and in collecting the objects they contain. Bower-birds were seen in the Macdonnell Ranges at our camp at the Ellery Creek, also at the Gilbert Spring and at Coporyllia, both on the north side of the James Ranges. Near our camp at the western end of the Palm Valley they were frequent, too, in the numerous wild fig-trees, but, though the tops of the adjacent hills were searched, no further playgrounds were seen. The food of these Central Australian Bower-birds appears to be a mixture of vegetable and insect life. The stomachs of one or two dissected showed plentiful remains of small beetles, seeds and the fruit of the wild-fig, intermingled with grit. One of the chief objects of my second visit to the Palm Valley in September was to secure a nest and eggs of this Bower-bird. By the end of that month all the small birds intending to breed seem to have accomplished their task, and were feeding young in the nest, or the young were already on the wing. Since the end of the preceding June not a drop of rain had fallen, and herbage was very scarce, leading in turn to a scarcity of insect life. About the end of the month I commenced a systematic search for a nest, accompanied by watching the birds at the playground during every spare moment. In this I was assisted by Houssian. About the middle of October we moved camp to within fifty yards of the eastern playground, choosing a pitch within hearing, but out of sight of the birds. No signs of a nest or nest building had up to then been observed. I concentrated all my efforts on the birds at this playground, watching and searching all the big Mulga and Witchity bushes, as well as the wild fig and *Callitris* pine trees both in the valley and on the neighbouring hill-tops. All was in vain. The birds were too much at the playground to be nesting. I was reluctantly forced to the conclusion that until a heavy fall of rain occurred, followed by a revival of insect life, the birds would not breed. I could have confirmed this by shooting a female, but was loth to do so. After watching Bower-birds at their playgrounds day after day, they become very familiar, and one comes to look upon them as pets. The last week in October we left the Palm Valley and travelled down the Finke in the hopes of better luck at Boggy Pool, where the Bower-birds were first met with. But in the meantime a thunderstorm with enough rain to fill small rock holes had passed over that locality, and on camping there we found no birds came to

the Pool to drink. At Oodnadatta, Miss Kunoth, who owns a commodious aviary, had a pair of Bower-birds in captivity with other species for nearly two years, when they unfortunately came to an untimely end. Had they been isolated, better results might have been attained. [Fine series. Specimens a trifle more yellowish on under surface than those from Murchison and the Hammersley Range, W.A.]

Corvus cecilæ. Australian Crow (Ngapa).—Very common, and rather unpopular on account of its predaceous habits. At the Mission Station Crows contended with the Kites for the scraps whenever a beast was cut up at the meat house. The Kites did not always have the best of the encounter. On leaving camp in the morning everything eatable had to be carefully covered up, especially such a commodity as flour. Crows commenced to breed in July, and continued to do so until the end of September or a little later. Thomas, our aboriginal guide, robbed a few nests, and I was interested to find that in nearly all cases the eggs were spotless, being much like large models of eggs of the European Starling. Some were, however, very finely and sparingly speckled. Only two eggs approached the boldly marked eggs of Crows from more southern latitudes. Nests were invariably placed in fairly tall Eucalypts, and were substantial structures of dry twigs, neatly finished off inside with fine grasses and strips of bark.

†*Cracticus nigrogularis*. Pied (Black-throated) Butcher-bird (Urbura).—A fairly common and generally distributed bird, becoming less numerous south of the Finke River. Its notes generally were amongst the first to herald the break of day. Nests were found near the Mission.

†*Cracticus torquatus*. Grey Butcher-bird. — Met with only near Boggy Waterhole, on the Finke River, and during our first camp in the Palm Valley in May last. On our second visit, in September, to the latter locality, the birds had disappeared. But on the return journey, as we were passing through a thicket of Mulga bushes near Boggy Waterhole, a male was heard calling. No nest was found.

Gymnorhina tibicen. Black-backed Magpie (Urara).—Rather an uncommon bird in all parts I visited. It was first identified at Goyder Creek on the outward journey. Pairs were also seen around Idracowra and Henbury Stations, where they were protected. Near the Mission there were two pairs, and at the fifteen-mile stockyard, further up the Finke River, I saw another pair. No nests were seen, but a very small boy brought me a single egg. I think it was a stray egg laid on the ground, as this boy and his companions were far too small to climb the slippery river gums in search of nests.

CONCLUSION.

We commenced the return journey on October 20th, when we bade farewell to the Palm Valley. Conditions were very dry. Thunderstorms on three consecutive days hardly resulted in twenty points of rain. We spent two days at Boggy Pool and also two days at Henbury. The further south we travelled the drier the country became. Conditions at times were trying. Strong winds, accompanied by clouds of dust, made camel-riding anything but pleasant. After leaving the Finke, near New Crown Station, feed became scarce, but the water difficulty was relieved for a time by a thunderstorm, accompanied by a fair fall of rain, on 30th of the month. From Charlotte Waters to Oodnadatta dry conditions prevailed again, and at times it was difficult to get the camels along except at a very slow pace. Our last camp was at Swallow Creek. We got an early start the following morning, and I was not sorry when the township came in sight.

It was the end of a most interesting trip, and I met with much kindness and hospitality from all with whom I came in contact. I am greatly indebted to all at the Hermannsburg Mission Station for the welcome I always received at their hands and for the interest they took in the expedition. I am especially indebted to Mr. H. A. Heinrich for his care of me during my illness, and my quick recovery was largely due to his unremitting attentions.

I am also indebted to Mr. Robert Buck for the kindest hospitality and best advice. Mr. Alan Breadon, of Idracowra, and Mr. A. Elliott, of Horseshoe Bend, also did all in their power to assist me in the quest for the Night-Parrot. Neither must I forget Mr. F. Jones, of Messrs. Fogarty and Co., both for the great interest he took in the expedition and for the efficient services he rendered. Houssian Sureen proved a valuable and reliable servant, and though engaged only to look after the camels and their loading, soon took an interest in the objective of the expedition. After a little instruction, he was able to discriminate between common and strange birds, and often brought in valuable specimens. He was a good shot, and possessed of acute powers of hearing—a great advantage when hunting secretive birds.

I arrived home on November 24th, after an absence of over eight months, during which I had travelled more than 5500 miles by rail, and over a thousand miles by camel; what I did on foot would be difficult to estimate.

[Again ornithology is deeply indebted to the public-spirited enterprise of Mr. White in sending Mr. F. L. Whitlock for a season to the far interior field and also to Mr. Whitlock for so ably carrying out his part of the expedition, notwithstanding a serious attack of illness. This last expedition links up the earlier important work of the Horn Expedition (1894), to which Mr. G. A. Kearnland was ornithologist collector, and later (1914) that accomplished by Captain and Mrs. S. A. White—all private enterprises! However, we should not forget Captain Barclay's expedition in 1911, which was equipped by the Commonwealth Government, when Mr. G. F. Hill, as naturalist, obtained valuable material and records.* Nevertheless, the vast interior is still, in an ornithological sense, practically "To let." All work at present accomplished points to a region of more than passing interest, because it has been shown to contain many zoological remainders of the most ancient part of the Continent. Detailed research of these remainders has yet to be worked out.]

Occurrences of the Ringed Dotterel in Australia.—Recently I had occasion to arrange some data on the *Charadriidae*, and find one interesting item worth ventilating, namely, a second occurrence of the Ringed Dotterel (*Charadrius hiaticulus*, Linnæus) in Australia. According to Bulletin XVIII. (29/10/22) of the British Ornithologists' Club, Mr. Gregory M. Mathews exhibited, amongst other specimens on loan from the National Museum, Melbourne, a skin of "*Charadrius hiaticulus*, from New South Wales." The specimen in question was from the "H. L. White Collection," and was collected by the late Mr. Robert Grant, at Long Bay, 30/8/1908. The first recorded instance—"an undoubted Australian specimen"—is given by Gould ("Handbook Birds of Australia," Vol. II., p. 231). That bird was killed at Port Stephens.—A. J. CAMPBELL, F.A.O.U.

**Emu*, XII., pp. 238 and 274.

On the Specific Names of Three Petrels.

By LEVERETT MILLS LOOMIS, F.A.O.U., Academy of Sciences, San Francisco.

In the preparation of a monograph of the Tubinares, I have had occasion to review the nomenclature of the group; and it has occurred to me that the accompanying notes, relating to South-western Pacific Tubinares, might be of interest to the readers of *The Emu*.

Procellaria solandri, Gould, Ann. and Mag. Nat. Hist., Vol. XIII., 1844, p. 363; type in British Museum. There appears to be no valid reason for connecting this species with *Procellaria melanopus*, Gmelin,¹ founded on the Black-toed Petrel of Latham.² The dimensions assigned to the Black-toed Petrel (length, thirteen inches; bill an inch and a half long) are dimensions of a much smaller bird than the one Gould named *Procellaria solandri*. It should be borne in mind that Latham measured the commissure, and not the culmen, in taking the length of the bill of Petrels. This fact is revealed by the length of bill he assigned to certain Petrels whose dimensions are now well known. For example, he states that the "bill is two inches long" in the "Fulmar Petrel," and "three-quarters of an inch in length" in the "Fork-tail Petrel."

The type specimen positively determines *solandri*. It is therefore maintained that *solandri* should stand as the specific name of the large, grey-backed Gadfly Petrel, breeding on Lord Howe Island, in the South-western Pacific.

Procellaria neglecta, Schlegel, Mus. Pays-Bas, Vol. VI., Procell., 1863, pp. 10, 11; types in Museum of Natural History, Leyden. The specific name *neglecta* is adopted for the dichromatic Gadfly Petrel described by Dr. Schlegel from specimens obtained in the Kermadec Group, South-western Pacific Ocean. Consequently, *phillipii*, G. R. Gray,³ based on the Norfolk Island Petrel of *The Voyage of Governor Phillip to Botany Bay* (1789), is rejected. The description of the Norfolk Island Petrel (*Voyage*, p. 161) and the accompanying plate appear to cover one of the variations of the Neglected Petrel, while the account of the nesting habits appears to indicate a burrowing species, or that the Neglected Petrel was confused by the collector with the Flesh-footed Shearwater or Wedge-tailed Shearwater, the three species having been reported in recent years from the Norfolk Islands. I see no good reason for intruding Solander's Petrel into the discussion, for it is a grey-backed bird, not a brown-backed one. A thorough investigation of the present day Petrel rookeries on the Norfolk Is-

¹Syst. Nat., Vol. I., pt. II., 1789, p. 562.

²Gen. Syn. Birds, Vol. III., pt. II., 1785, p. 408.

³Ibis, 1862, p. 246.

lands would probably shed further light on the question. Be this as it may, it is apparent that a questionable eighteenth century description, unsupported by specimens from the type locality, does not afford sufficient evidence to supplant a long-established specific name, supported by type specimens and a description.

Puffinus chlororhynchus, Lesson, *Traité d'Orn.*, 1831, p. 613; type in Muséum d'Histoire Naturelle, Paris. Appended is Latham's description of his Pacific Petrel⁴ (*Procellaria pacifica*, Gmelin⁵), which of late has been interpreted as a description of the Wedge-tailed Shearwater.

"Length twenty-two inches; breadth, forty inches. The bill is two inches in length, of a lead-colour, and much hooked at the tip; in the place of a tube the nostrils only appear; they are situated obliquely, of an oval shape, a little elevated, and placed an inch and a quarter from the base: the upper parts of the plumage are black, the under dusky; legs pale on the insteps, where they are marked with some black spots, and a few others on the toes and webs. Inhabits *Euopoa*, and other islands of the *Pacific Ocean*."

The dimensions given in the above description are more nearly applicable to the Flesh-footed Shearwater than to the Wedge-tailed, and the coloration ascribed to the bill applies to certain examples of both species.⁶ Furthermore, I find no mention of an island bearing the name of *Euopoa*, either in Captain Cook's *Voyages*, or in Sir Joseph Banks's *Journal*. In the latter, however, occurs the following entry for July 20, 1769:—"At noon to-day we came to anchor at Uhi-tea, in a bay called by the natives Oapoa, the entrance of which is very near a small islet called Owhattera."⁷ Captain Cook⁸ charted and described this bay under the name of Oopoa Harbour, in Ulietea. It is obvious that the spelling of Polynesian names by early voyagers is to be taken with some allowance.

Mr. Lionel W. Wigglesworth⁹ has identified *Euopoa* as an island of the Marquesas group. But the island he apparently had in mind, Huapu (variously spelled Ouapoa, Ouapou, Roapoa, Roapoua, Roa Pua, Roua Poua, Uapoa, Uapu), was not discovered until 1791.¹⁰

⁴Gen. Syn. Birds, Vol. III., pt. II., 1785, p. 416.

⁵Syst. Nat., Vol. I., pt. II., 1789, p. 560.

⁶Cf. Hull, "Emu," Vol. XXI., 1922, p. 288.

⁷Journ. Sir Joseph Banks, p. 113.

⁸Voy. Round the World in 1768-1771, in Vol. II. of Hawkesworth's *Voyages*, 1773, pl., p. 258.

⁹Aves Polynesiae, Abh. k. Zool. u. Anth. Ethn. Mus. zu Dresden, No. 6, 1891, p. 81.

¹⁰Cf. Brigham, Index to Is. of Pacific, Mem. B. P. Bishop, Mus., Vol. I., No. 2, 1900, p. 100; Penny Cyc.; et al.

It is evident that the description of the Pacific Petrel is not definite enough for the identification of the Shearwater Latham had before him, and it is idle to read into the description a meaning the words do not convey. I see, therefore, no justification for discarding determined *chlororhynchus* and substituting undetermined *pacifica* as the specific name of the Wedge-tailed Shearwater. In fine, a long-established specific name should not be superseded unless the evidence against it is beyond reasonable doubt. The law of priority is accepted as a means of obtaining stability, not instability, of names.

If a stable nomenclature is to be attained in species and the higher groups, such a nomenclature must be the outcome of investigations by monographers having a profound knowledge of their special subjects. All-around name hunters have failed because the quarry has been beyond the reach of superficial knowledge.

Spider Webs and Birds.—I was very interested in the note (*Emu*, Vol. XXIII., p. 236) and photographs by Mrs. Innis Humphrey, of Poopoonah, Q. They brought back to my mind a similar experience which came under my notice when a child in Queensland, and living a few miles from Toowoomba. One afternoon I saw a small bird apparently caught in nothing. From the distance its wings appeared to be folded to its sides, giving it the appearance of having suddenly stopped in the air while falling. I ran along to investigate, and found the bird, a Fly-eater (*Gerygone*), from what I remember, wrapped in a spider web. I cannot say how long it had been there, but it seemed too weak to struggle free. The web was spun between two gum saplings, just off the crown of a rather sharp hill, and, to my mind, in such a position easily to trap a small bird flying quickly downhill. By the time it noticed the web it would be in it. As I watched, a large, black spider, with a greenish tinge, began to descend from a bunch of leaves in the left-hand sapling. The captive commenced to tremble or struggle, I am not sure which now. Anyhow, I know my sympathy for the bird came uppermost, and I seized a stick, smashed the web, freed the bird from the sticky stuff, when it flew away from my hands. The spider retreated to his den. Since then, I have wished my childish sympathy had waited a while to see what the spider would do. Once again I found another web in a similar position. A Leatherhead (*Tropidorhynchus*) made a sharp curve upwards to avoid being entangled in its meshes. I do not suppose that the strands would retain such a large victim; still, it is surprising the strength there is in a cobweb. I have tested the webs of this spider with my fingers, and found them very strong and sticky. I have also run straight into one without seeing it until arrested by the horrid stuff all over my face. It is most disagreeable.—(Miss) J. A. FLETCHER, R.A.O.U., "Lyeltya," Eaglehawk Neck (Tas.).

Relationships of Tasmanian Birds.

By ROBERT HALL, C.M.B.O.U. Sometime President
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Part II.—Continued.

The Tasmanian Brown Quail, or Swamp-Quail (*Synoicus ypsilophorus*)—Map II.*b*.—is less plentiful in the south of the island State, and owing to the inferior food supply the egg-clutches are smaller. When the food supply promises to be on the short delivery side, birds do not lay a large number of eggs. Emus will not lay any if the season promises to be droughty, and though there are several hundred Coots (*Fulica atra*) in a swamp on Mr. W. L. May's property, they did not nest this past dry season. On the Derwent watershed we never hear of clutches of 19 eggs with Quail. Being downy, the young feed direct in contradistinction to being fed by regurgitation.

The Painted Quail (*Turnix varia*) (Map II.*c*.) nests earlier on the East Coast of Tasmania than it does on the Derwent, while about Bass Strait it will lay eggs in the middle of October. In Map II., *a* is partial to cereal crops, *b* to low-lying ground, *c* to dry or stony areas.

Our best field knowledge of Crakes is contained in articles by Miss J. A. Fletcher, in *The Emu*, Vol. XIII., p. 45; XVI., p. 46. The owners of the calls of the swamp are rarely identified, because of the shyness of this family. If you hear a miniature motor car at work in the swamp, put it down to the puff, puff, puff of the Spotless Crake (*Porzana plumbea*)—Map II.*h*. The male of the Slate-breasted Water Rail (*Rallus pectoralis*)—Map II.*d*.—will call with its loud metallic "tic, tic, tic," when the hen will purr much as a happy cat does. Incidentally, I should like to say that, in relation to birds, I bear no good will towards cats, Persian or Tabby. If at the same swamp one hears a grunt and the process of saw-sharpening, put it down to the Tasmanian Native Hen (*Tribonyx mortieri*)—Map II.*i*. This species lays up to sixteen eggs in a clutch.

The Tasmanian Bald Coot (*Porphyrio melanotus fletcheræ*)—Map II.*j*.—utters a cry which is taken up by nearly every member of its kind, until the swamp is no longer a silent waste. Bridge-water is the place for Crakes, as many as 37 nests having been observed in one season; the eggs agreeing in colour with their surroundings.

Of Penguins, we have two species, the distribution being shown in Map III., one of which is (except the Galapagos Penguin) the most northerly of all Penguins—birds of the southern hemisphere. During Winter, between Hobart and South Arm it is a daily occurrence to see this torpedo-like Little

Penguin (*Eudyptes minor*) resting upon the water. On the dark evenings of Winter, the birds call like dogs. The Crested Penguin (*Eudyptes chrysocome*) is much more rare, while the King Penguin (*Aptenodytes patagonica*) is merely a visitor on rare occasions. Penguins were possibly once flying birds, but we cannot place their immediate ancestors. Their present relatives seem to be the Petrels.

After March it is quite an ordinary affair to see a flock of Mutton-birds (*Puffinus tenuirostris*) coming up the harbour. Off the open beach at South Arm many species may be seen from time to time. The same may be said of Terns, in particular the Crested and Caspian Terns (*Sterna bergii* and *S. caspia*). While fishing in their coursing flight of head down and tail forked, with a cry like the querrulous flick of a whistle, it makes an unmistakable figure. When tiny herrings come in, as they do every few years, the Australian Gannet (*Sula serrator*) follows. Bass Strait is a better feeding ground, and nearer their rookery. With good fishing it will come up to Hobart. The clear penetrating call of the Oyster-Catcher (*Hamatopus*) is given when on the wing. (Map IV.c.) The Silver Gull (*Larus nova-hollandia*) and Pacific Gull (*Gabianus pacificus*) daily frequent the beaches of Hobart, not for what they can get in them, but on them. They nest off South Arm. Next to Gulls come the Plovers. We quickly see on the beach the relationship and resemblance of their eggs. The Black-breasted or Banded Plover (*Zonifer tricolor*) nests on the flats at the foot of Mt. Rumney, and others near the River Derwent. Two doors from my residence in Bellerive there is a swamp full of succulent weeds, and cows, with a few horses, and numberless tame ducks. In the midst of this turmoil there is, and has been for several weeks, a solitary Bar-tailed Godwit (*Limosa lapponica*). For a wild bird, and one universally recorded as wild, there is no tamer one. It is most approachable, not to say friendly. At all times I met it working hard, stirring the plants and irritating the muddled animals; apparently an all time performance. To see this small bird with an exceedingly long bill vigorously and perpetually moving its head to get its bill well in and often, is a most unusual, but a particularly attractive, sight. I hope the next record of it will not be a sad one; a matter of a boy with a gun.

Plovers are a widely distributed family, as may be gathered from Map IV., and the list of Derwent species as under:— 1, Southern Stone Plover (*Burhinus magirostris*), and for distribution of associated species, see Map XI., p. 84, Vol. XIX. This is accidental to Tasmania. 2, Turnstone (*Arenaria interpres*). 3, 4, Pied and Black Oyster-Catchers (*Hamatopus*). 5, Spur-winged Plover (*Lobibyr lobatus*). 6, Black-breasted or Banded Plover (*Zonifer*). 7, Grey Plover (*Squatarola*

squatorola). 8, Lesser Golden Plover (*Pluvialis dominicus*). 9, Double-banded Dotterel (*Charadrius bicinctus*). 10, Red-capped Dotterel (*C. ruficapillus*). 11, Black-fronted Dotterel (*C. melanops*). 12, Hooded Dotterel (*C. cucullatus*). 13, White-headed Stilt (*Himantopus leucocephalus*), rare in Tasmania. 14, Banded Stilt (*Cladorhynchus leucocephalus*), rare in Tasmania. 15, Red-necked Avocet (*Recurvirostra nova-hollandiæ*), rare in Tasmania. 16, 17, 18, Curlew, Whimbrel and Little Whimbrel, Map, *Emu*, Vol. XIX., p. 85, Map III. (1919). 19, The Bar-tailed Godwit (*Limosa lapponica*). 20, The Green-shank (*Glottis nebularius*). 21, Eastern Little Stint (*Pisobia ruficollis*), see *Emu*, Vol. XIX., Map IV., p. 85; *d* should read as showing two known nesting areas. 22, Sharp-tailed Stint (*P. acuminata*). 23, Curlew Sandpiper (*Erolia ferruginea*). 24, Australian Snipe (*Gallinago hardwicki*); *Emu*, Vol. XIX., Map V., p. 85 (put the letter *c* before the word European in plate text). 25, Australian Painted Snipe (*Rostratula australis*).

This is the Tasmanian list of Plover-like birds, and with exception of 1, 13, 14 and 15, all have been observed in the Lower Derwent (South Arm). 13, 14, 15 have been observed in the upper estuarine waters of the Derwent, while 1 has been heard over Rumney Range.

The Herons make up another family mostly found all over the world. The Tasmanian species are to be found in, or close in, to the Derwent River, and they are distributed as is shown in Map V. The Reef Heron (*Demigretta sacra*) is the one rarely found within the mouth of the river, and never up the estuary. The Nankeen Night Heron (*Nycticorax*) and the White Egret (*Egretta alba*) are rare birds so far south, and are very occasionally seen about Bridgewater. The first is rather a wanderer beyond the bounds set down for him. (Map V.b.).

Then follow the Ducks, and Bridgewater is the suburban area suitable to them. There are mud flats and grass flats and low tides to please those who follow them.

During the Winter, when our Alpine Sea, the Great Lake, is mostly frozen, the White-eyed Duck (*Nyroca australis*) descends to Bridgewater. To a lesser degree, the same may be said of the Blue-billed Duck (*Oxyura australis*). The scarcest of all is the Freckled Duck (*Stictonetta naevosa*). Chestnut Teal (*Virago castanea*), and Gray (Black) Duck (*Anas superciliosa*) are both occasionally seen in large flocks, but mostly in small ones.

The most important of the order of Goose-like birds is the Black Swan (*Chenopsis atrata*). Settlement continues to make a difficulty, as poachers are difficult things to keep within bounds, however watchful. Occasionally, the Upper Derwent gets a visit from another web-footer—the Pied Goose (*Anseranas semipalmata*), though it is

now only a rare occurrence. At one time the overflow of Geese in Southern Victoria came on to the Great Lake country, but the community in Northern Victoria has not enough for its own use, or joy of beauty. It would need to be a great eruption from Queensland to give more than the odd bird to Tasmania.

Looking for Ducks, one will always see Cormorants; certainly this past year. Even in fishy Polynesia, where Cormorants are said to be absent, they will probably be there this year. The general exodus from the parched areas of Australia is overwhelming the outlying parts, such as Tasmania, and our introduced trouts are suffering accordingly. It is rather strange that this world-wide genus, a single genus, should be absent from that most promising island area east of Queensland. The climate of New Zealand is typical of their chosen air, so most likely excess of heat checks them. Map VI. shows how our four common species keep well in, and away from Polynesia, as if it had some tropical disease. The White-breasted Cormorant (*Phalacrocorax fuscescens*) keeps closest in to the mainland of the Commonwealth. The Little Pied goes further north, and the Little Black still further. The great Black Cormorant (*P. carbo*) is broadly distributed very much, as indicated in the outer lines (a) of Map VI. Some twenty-five years ago it devastated the native fish beds of the country of the "nineteen lagoons" just as it is doing to-day with the rainbow trout of the adjacent highland waters. In its own interests, it is as capable a fisher in salt water as in fresh water; on sea level, or at 3500ft. At this moment, and right under the very noses of the people of this fair city, there is a flock on Rosny Point, cuddled in from the breezes; but there, preening their feathers, they live in the most affluent of circumstances, while small crayfish are selling at one shilling each a few doors away, so to speak. It is not intended that this little note will disturb their happy home. At Bridgewater they are rather numerous, the drying of the adjacent waterholes driving them in towards the tidal flats. The fish that remain will have the fuller value of the feeding beds.

Passing away from fish-eaters to flesh-eaters, we have the Hawks, a list of which is given in the text of Map VII. These ten are the whole of the Tasmanian species, and the map shows their distribution. The Collared Sparrow Hawk (*Accipiter cirrhocephalus*) is the hedgerow hunter of modern and ancient days, while the Little Falcon (*Falco longipennis*), being more rapid on the wing, keeps to the open. The steady and useful Brown Hawk (*Ieracidea berigora*) is still of economic value as a destroyer of grass grubs, the Swamp-Harrier (*Circus approximans gouldi*) attending to the larger vermin of the flats and marshes, and the undulating country. The Kestrel (*Cerchneis cenchroides*) has bred on the Rumney Range, where I have

secured a young one just from the nest. The Osprey (*Pandion haliaetus*) one rarely sees as far south as Southern Tasmania.

The call of the Spotted Owl (*Ninox maculata*) commences in August, in voice being our substitute for the cuckoo of the northern hemisphere. So far it has not stimulated our poets to flights of fine imagination. When in Siberia I had my love of the Boobook recalled by hearing the Asiatic Cuckoo's double call.

The Parrot-like birds of A—D have their distribution shown in Maps VIII., IX., X., and XI. The Rainbow (*Swainsoni*) Lorikeet is surely a most uncertain migrant, and the Ganggang Cockatoo is seldom heard; the Blue-gums (*Eucalyptus globulus*) blossom profusely in any month offering good attraction to the Parrots.

The Tasmanian Frog-mouth (*Podargus strigoides cuvieri*) keeps more on the eastern side of the river. The Sacred Kingfisher (*Halcyon sanctus*) is mostly a visitor from the mainland, over which it has a broad and, I think, complete distribution. More than that, it is to be found on certain of the distant islands. In this State the temperature is too low—mostly a rigorous cold. The Blue Kingfisher (*Alcyon azurea*) has been seen on the lower slopes near Hobart. For distribution of the other Kingfishers, see the maps in *The Emu* (Map XII., p. 84, Vol. XIX.). Two Swifts fly over Tasmania, the ways of which Mr. Stuart Dove is watching.

Cuckoos come to us in July (*Cuculus pallidus*, 23.7.10) if the season is favourable; an early Spring. Other birds will then build early, of which fifteen species in Tasmania act as foster parents. In Australia ninety-four species have to sacrifice their own families. (See *The Emu*, Vol. XIV., p. 146, H. L. White.)

The voice of the Fantail Cuckoo (*Cacomantis flabelliformis*) is rippling, soft and sweet, while that of the Bronze Cuckoo (*Chalcococcyx plagosus*) is a series of eight plaintive notes. The Shining Bronze Cuckoo (*C. lucidus*) has 8-10 long silvery notes, quickly repeated, the first sounding far away, the last quite near; if the bird is near, one of the Bronze section has a long-drawn melancholy call. The Pallid (*Cuculus pallidus*) has a series of crescendo semi-tones, beginning low in the scale, and concluding well up; fairly quick throughout. The call is certainly more or less ventriloquial in all the Cuckoos, just as we find it in the Striated Field-Wren (*Calamanthus*), and in the Fantail-Warbler (*Cisticola exilis*), with its sharp wheezing, but not piercing, call (Donald Thomson). Both Mr. A. H. E. Mattingley and Mr. Charles Barrett have contributed to *The Emu* interesting and instructive notes. For the distribution of *Cacomantis* and *Chalcococcyx*, see *Emu*, Vol. XIX., p. 85, Map VII.

First in the list of singing and normally passerine birds is our Tree-Martin (*Hylochelidon nigricans*) coming to us from New Guinea. The young of the Welcome Swallow (*Hirundo neoxena*) is fed as well, while on the wing, though they have a trying time if the food-supply is feeble.

Then follow the Robins, of which A—D have four distinct species distributed, as shown in Map XII.

The Flame-breasted Robin (*Petroica phoenicea*) nests on Mt. Wellington, and through to the West Coast. One nest was carefully placed in a burnt log, with charred pieces attached to it for protection. The hen appeared to do all the incubating, leaving the nest only occasionally for a drink.

In January I have seen the young male just getting his plumage of youth, with the throat and breast bursting into red. The chest still had its browns, with the reds in hiding beneath them.

Tasmania has three Flycatchers, one of which, the Dusky Fantail (*Rhipidura diemenensis*) is commonly found on the Derwent. The other two are rare—the Satin Flycatcher (*Myiagra nitida*) and the Leaden Flycatcher (*M. plumbea*). *M. nitida* is apparently Papuan in its origin. See Map XIII.b.

The Black-faced Cuckoo Shrike (*Graucalus novæ-hollandiæ*) is a particularly useful bird among the Wattles of the Rumney Range. This valuable tannin tree has numerous enemies, and a great friend in this species. This bird has a soft purring note, and attracts one's attention by the way it has of settling down after flight; one wing deliberately put over the other, carefully folding the ends. It is a harbinger of Spring.

Among our late nesting birds we have the White-fronted Chat (*Epthianira albifrons*). I have seen at Bellerive the male brooding over newly hatched young on 27.3.16. At Bridgewater we find it, and the Striated Field Wren (*Calamanthus*) and the European Skylark (*Alauda*). They resemble each other in song, though the latter is finer. When among these birds, expect the double plaintive whistle of the Little Grass Bird (*Megalurus gramineus*), a genus fond of open, ferny, bush country, and sand dunes.

Occasionally one will meet the Reed Warbler (*Acrocephalus australis*), by hearing its rich song or warble. It is related to the Tit-Warblers or Thornbills; of these latter Tasmania has four species—three being purely island forms:—

1. *Acanthiza pusilla diemenensis*, Brown-rumped Thornbill; the Forest Tit.
2. *A. p. archibaldi*, Large-billed Thornbill (King Island), not in Tasmania proper.
3. *A. ewingi*, Tasmanian Thornbill; the Creek Tit with a rufescent forehead.

4. *Geobasileus chrysorrhous*, Yellow-tailed Thornbill, marked by G. M. Mathews as *G. c. leachi*, The Tasmanian Yellow-tailed Tit.

1, is found principally in area A; 3, in B; 4, in the more open country of all. The Scrub-tit (*Acanthornis magna*) is to be looked for in area B.

The Brown Scrub-Wren (*Sericornis humilis*) and the Long-tailed Blue Wren (*Malurus longicaudus*) are fairly common. The life history of *Malurus* (Blue Wren) is remarkably like that of the Emu Wren (*Stipiturus malachurus*). The Whistling Shrike-Thrush (*Colluricincla selbii*) has a voice slightly more plaintive than that of the mainland bird. The usual day-call is wok-chee-whitte. Like the Noisy Miner (*Myzantha garrula*) it rises in the morning with a long musical vocabulary. The Magpie-lark (*Grallina cyanoleuca*) and the White-throated Tree-creeper (*Climacteris leucophaea*) are quite absent in A—D. The Silvereye (*Zosterops lateralis*) does much good in the south, and we grow neither grapes nor figs to take away the good character the bird has.

The Pardalotes of the Derwent are distributed as shown in Map XIV. The Forty Spot (*P. quadragintus*) is found in area A, but not in area B. It is mostly in the western portion of A, and less so on Forestier's Peninsula, country similar to western A; and it is found north at Bridport, in isolated wet country. The Yellow-tipped Pardalote (*P. striatus*) has caused an immense amount of care in attempts to fix its specific character. In *Novitates Zoologicae*, Vol. XVIII., p. 387, Mr. Mathews makes seven sub-species of it.

In Map XIV., *a* is found in the tree-tops of heavy country; *b* in open country, midway in the eucalypt trees; *c* near the ground in scrub, occasionally going into the domain of *b*.

Pardalotes get new clothing by chemical change as well as by moult, and the nesting habits of mainland species described by Messrs. L. G. Chandler and F. E. Wilson (*The Emu*, Vol. X., pt. 2, p. 119) fit in well with two of the three Tasmanian species.

Here again we see that Southern Queensland is the starting ground of many species, with a westerly diversion in Victoria.

Of *Meliphagidae*, the Honeyeating family, there are nine genera distributed, as shown in Map XV., *a, b, c*. The Yellow-throated Honeyeater (*Meliphaga flavigula*) is the most widely distributed in Tasmania. It goes to the top of mountains at 4000ft., Mts. Wellington, Roland and Barrow. The Strong-billed Honeyeater (*Melithreptus validirostris*) associates with it on lower slopes, uttering a shrill note. The Tasmanian Spinebill (*Acanthorhynchus dubius*) and White-bearded or Yellow-winged Honeyeater (*Meliornis novæ-hollandiæ*) are also widely-spread species, but at lower levels. The Black-headed (*Melithreptus affinis*) is the smallest Tasmanian Honeyeater. According to

Mr. G. M. Mathews, the Tawny-crowned Honeyeater (*Glyciphila melanops crassirostris*), found in Tasmania, is purely an island form. The Western Australian form shows a geographical difference, variable though it be; see Map XV.b. The Derwent Honeyeaters appear to be all derived from those of Southern Queensland. Young Strongbills (*Melithreptus validirostris*) I have found on Mt. Wellington as early as 31.8.09. With the Spinebill, the hen bird carries all the material to the nest, so far as I have observed, the male arranging and weaving the hair, wool, etc. The Noisy Miner (*Mysantha garrula*) is well distributed in areas A—D. One bird in September will call "peep, peep, peep," high in the scale, and be answered by its mate, "chua, chua, chua," low in the scale. The young birds learning the morning song are very variable in their performances. The adult male bird is well worth camping against to get its twenty minutes of genuine morning song; just before the sun rises and before it leaves its perch. During the past five years my residence, widely surrounded by trees, has had its special Miners and their young. During that period we have always breakfasted on the verandah, facing the sea and mountain, and no Miners have given any heed to us.

Suddenly one developed a most friendly interest* and cupboard love, and for several weeks came regularly, to fly off with a share of the sweets of our meal. As suddenly it left us stranded of visits, and has not returned.

The Wattle-birds love the Banksias of the coast districts. The Pipit (*Anthus australis*) is well distributed, and gets high up the mountains, though no record is possible in Tasmania to equal that of Mr. R. H. Croll, at Mt. Bogong, 6508ft., and Kosciusko, on the summit, over 7000ft. It does seem rather wonderful that thousands of Pipits leave Victoria every Spring, crossing Bass Strait in the night, and reaching Tasmania in the morning,** while thousands of other Pipits of the same species in Victoria leave the lowlands for the highlands as a bathic migration.

Tasmania's only Weaver Finch, the Beautiful Firetail (*Zonæginthus bellus*), nests early and late in Spring and Summer.

So far we have discovered neither Crow nor Jackdaw upon the Derwent, in Tasmania, the large black bird being the Australian Raven (*Corvus coronoides*). Of Bell-Magpies we have two species—one the Hill Bell-Magpie (*Strepera arguta*), the other the Black Bell-Magpie (*S. fuliginosa*), being found on King Island as well. The "kling-klang" of the first is heard in the highlands in Spring, and the lowlands in Winter. The Butcher-Bird (*Cracticus*) and Pied Magpies are included in

*See Vol. IX., pt. 2, p. 95; XI., pt. 2, p. 108.

**Vol. XVIII., pt. 3, p. 202 (H. S. Dove).

this family. The Grey Butcher-bird (*C. torquatus cinereus*) is the island form, and, like its fellows, it is an arrant robber and a gourmand. It burgles in the daytime, going off with the young of any parents it can intimidate. The lovable part of the bird is its rich voice, calling "tel-e-fo, telefo, fo-fo-fo," and its "musical at home." The last, and amongst the best, of useful birds in Tasmania is the Lesser White-backed Magpie (*Gymnorhina hypoleuca*).

The valley of the Derwent and adjacent hills also need all such birds for economic purposes. We find in this valley, comparatively healthy and cold, that Magpies are seldom at any time numerous. In the great valley along one flank of Rumney Range I have this season found nesting no less than fifteen of the twenty-five birds peculiar to Tasmania: mostly insect-eating birds. Two years from now, the timber of this valley, most unfortunately, will be cut out, and the birds dispersed.

This valley is one of the finest for fruitgrowers, and many pests need more of the birds to keep the safety line of balance. If the birds are not encouraged to multiply, not to speak of discouraged, the cost of suppressing the pests will be infinitely heavier, and not successful. The growers of the Derwent Valley know already what it means, and the most intelligent of them realise that no spray is equal to the value of the presence of Quail and most of the smaller birds.

The Birds of the Camp-out.— May I be permitted to state that, from my experience in the swamps around the Scottsdale district, I should say the bird heard calling under heading of *Porzana fluminea* (Emu, Vol. XXIII., p. 200), and noted by Messrs. Parsons and McGilp, would more likely be the Spotless Crake (*Porzana plumbea*). I am astonished that they have not listed this bird, which is strongly represented in that district. The calls of the two Crakes are almost, if not quite, identical, when disturbed near the nest, or when one mate gives the alarm signal to warn his partner. I waded and explored "acres" of every description of swamp in that locality to ascertain whether the Australian Spotted Crake (*P. fluminea*) were present, yet never found it. I came to the conclusion that this species prefers brackish water localities. It would be interesting if some ornithologist should later come across this bird in that habitat. The pair of Emu-wrens (*Stipiturus malachurus*) mentioned in the same paper was evidently preparing the second nest. Most of the Emu-wrens in that part of the country have the first nest well under way in September.—(Miss) J. A. FLETCHER, R.A.O.U., "Lyeltya," Eaglehawk Neck (Tas.), 8/3/24.

Notes on Extinct or Rare Australian Birds, with Suggestions as to Some of the Causes of their Disappearance.

By EDWIN ASHBY, M.B.O.U., C.F.A.O.U., Etc., "Wittunga,"
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PART II.

DISCUSSION OF CAUSES CONTRIBUTING TO THE APPARENT RARITY OF CERTAIN SPECIES, WITH SUGGESTIONS AS TO THE BEST MEANS OF THEIR ADEQUATE PROTECTION.

The data supplied in the notes contained in Part I. of this paper indicate that care should be taken in making statements as to the rarity of certain species.

For instance, in a recent discussion, it was stated that "Port Lincoln and Ring-necked Parrots are not pests, nor common," and the Black-tailed Parrot (*Polytelis anthopeplus*) was referred to as becoming very rare, with danger of possible extinction. As a matter of fact, the last named is still fairly numerous in the Loxton district, in this State, and it ranges from there in favoured places to the interior of Western Australia, and with an extension of many hundreds of miles northwards in that State. I collected a specimen many years ago near Broome Hill, in that State, and was informed that it was numerous in the interior, where "Marlock" (a species of *Eucalypt*) grew, and only rarely came to Eticup. At the present time, Mr. Orton informs me, that there is an irruption of these birds into the Moora district, where they are breeding. Their usual range is further back in places rarely visited by ornithologists.

Again, the two species of *Barnardius*, referred to above, are found over large areas of interior country, and are, in some of these localities, quite as numerous as are the commonest *Platycerci* (*Rosella*) in the State of Victoria. I have myself seen the Port Lincoln Parrot in great numbers back from the coast of Eyre's Peninsula, and found it numerous, say, 1500 miles away, from Moora northwards to the Murchison.

Again, I happened last year, at the invitation of the Chairman of the R.A.O.U. Council, to be one of a deputation that waited on the Minister for Customs, *re* the export of native birds. At that deputation reference was made to the four pairs of Turquoise Parrot (*Neophema pulchella*) that had recently been observed, in such a manner as to give the impression that they were very rare indeed. I wish to emphasise the need of being careful not to mislead either the public or the Government by statements unsupported by sufficient data.

While during the last 10 to 20 years statements have been made to the effect that the Scarlet-chested, Turquoise and Paradise Parrots were probably approaching extinction, I have consistently stated that, in my opinion, there was little ground for that conclusion, for I believed that these birds had, for reasons to be discussed later, left the localities where observers had previously known them, and gone what we call "back." That is, they had disappeared into the great unpeopled spaces of this sparsely populated continent.

Recent records have somewhat endorsed this view. The trouble is that workers in ornithology are limited in numbers, and the wide, unpeopled spaces of this continent are so vast, that species that have been driven back from the peopled districts (which, in proportion, are only a fringe round the big centres of population) are lost "like a needle in a haystack."

The data supplied in Part I. of this paper, respecting the Orange-breasted Grass Parrot (*Neophema chrysogaster*), illustrates this fact. Here a little Grass-Parrot, evidently still numbering some thousands, was completely lost for 33 years, and again, within a week or so of the last observations, was as completely lost as before.

The few existing workers are naturally mostly congregated round the capital cities, and their opportunities of research in the vast interior are limited to a few spasmodic journeys, which are obviously inadequate for the working out of the ornithological problems of this continent. An excellent foundation has been laid in the study of Australian Ornithology, but this study is, in my opinion, still in its infancy.

Up to the present, the terms "rare or almost extinct" probably mean no more than that the speaker has not been where the particular bird referred to now is, or that the birds have disappeared from the old haunts with which the speaker was familiar.

CAUSES OF DISAPPEARANCE.

At the present state of ornithological knowledge in Australia, we have to limit the discussion to the disappearance or extreme rarity of certain birds in limited areas. The case of mammals is, and always has been, very different, for, in addition to the serious menace of the commercial element in the case of fur-bearing mammals, there is the much greater difficulty as compared with birds, of crossing from one patch of scrub to another across areas encroached upon by farms.

It will be admitted by all that the cause of the disappearance of certain species of birds from specified localities has been the coming of civilisation.

(a) The turning of the country into farms, arable or grazing, has removed the food of certain forms, for instance, the Grass-Parrots (*Neophema*).

(b) The destruction of all timber and bushes with the installation of divisional post and wire fences instead of hedges, as in Great Britain, has had still more to do with their disappearance.

(c) The most serious factor of all is the destruction of both food supply and shelter, and, of course, breeding haunts, by bush-fires.

I consider that these three factors, especially the last one of bush-fires, account for more than nine-tenths of the disappearance of certain forms.

(d) The free distribution of poison for vermin and the poisoning of waters is wholesale in its destructive effects, but, as far as my enquiries go, it has not been anywhere the real cause of their disappearance, although in some cases it might have been contributory.

(e) The following may, in a minor degree, be considered contributing factors, but I consider that undue emphasis has been placed upon them because the natural fecundity of our native birds has, in the main, been sufficient to meet the wastage from these sources. These factors are: The killing by man for sport (killing for study has had little detrimental influence); the destruction by the predaceous animals introduced by man, such as cats, foxes, rats, etc.—these latter, except in confined areas, such as islands, do not, in my opinion, seriously count. The abundance of ground-nesting birds in Europe, in places where both cats and foxes are numerous, seems to support this view.

In a paper by the writer, published in *The Emu*, Vol. XX., p. 132, reference is made to the fact that the Ground Parrot (*Pezoporus wallicus*) had 25 years earlier been common in the sand-plain country between Watheroo and Dongara, in W.A., its disappearance being probably due to the continuous fires that had swept through the low bushes that then covered these sand-plains. Also in another paper in the same issue, I showed that the Western Whip Bird (*Psophodes nigrigularis*) had disappeared from its old haunt near Ellensbrook, probably through the dense, low bush that bordered the sea coast being continually burnt to increase the feed for the sheep.

I am confident that the indiscriminate burning of the bush, which is the concomitant of all farming and grazing operations in bush country, is by a long way the major cause of the disappearance of many of our rarer birds. Undoubtedly, if fires are lit during the nesting season, the brood will be destroyed, but possibly some adult birds will escape, and we may conclude that, in some cases, when they find their shelter gone, they move to some new locality far from the disturbing influences of man.

I am satisfied that this has been the case with some of the species we have considered extinct, or nearly so. If we search in back country which has not been devastated by fires, and in which the needed conditions are to be found, I feel sure that some of these "rare" birds will be still found.

If we are to keep our native birds, we must give them shelter and protection during the breeding season; without this, all other forms of protection are useless.

As one of the earliest workers in the advocacy of protective legislation, I feel in some measure condemned, because, as far as most of our legislation is concerned, the only gain towards the survival of our native birds has been the provision of Bird Sanctuaries and protection during the breeding season; most of the talk and public comment has centred upon the negative side, "thou shalt not," whereas really effective results can only be obtained by a more vigorous policy on the positive side.

At the last R.A.O.U. Congress, on the writer's motion, the following resolution was carried: "That we request each State Government to set apart in all future surveys of (new) townships a reserve of not less than 300 acres, and request that this area should be left in a state of nature. And that all farmers be urged to save some natural shelter for insectivorous birds."

At each annual congress of this Union I would suggest that there should be a report submitted showing what new townships have been surveyed during the year, and what fauna and flora reservations have been set apart. We need to impress upon farmers and graziers that the services rendered by insectivorous birds far outweigh any cost that may be incurred through vermin harbouring in these reserves.

All who visit Great Britain are astonished at the abundance of bird-life in spite of the limited areas that are still unenclosed. The secret of it is in the broad hedgerows or narrow strips of copse or wood that border each field. The writer was very interested in learning from an antiquarian that these strips of "scrub" dividing the fields are many of them of comparatively recent origin, dating back to the time when the little parcels of land held by the same individual were consolidated. We find in Australia that, in suburbs where considerable portions of the gardens consist of shrubbery, in spite of the increased number of cats, there is an increase in the number of birds. We should persuade all householders to supply this needed protection by the planting of massed shrubs. We shall do more if we can get farmers to keep broad strips planted with shrubs and trees between their paddocks, acting as wind-breaks and shelter, besides supplying the needed breeding places for our birds.

Much talk of protection, both in and out of the Press, supported as it is by so little useful action, is ineffective. One illustration will suffice. In November, 1912, I made the trip from Tenterfield to Lismore, in northern New South Wales, and found that the virgin, tropical bush had entirely disappeared from the coastal district. I went back the next morning to that portion of the route where the road crosses the Richmond Range, at a little bush township called Mallanganee, and had five of the best days of my life amongst the scrub and charming tropical bush of that locality.

When I came back, I brought the matter up before our Royal Society, pointing out that this mile of virgin scrub was all that was left along the mail road, and that its existence was due to the stony nature of the soil at that spot making it almost impossible for the first settlers to make a living. I was informed that the Government were then cutting up that area in small leases. A resolution was carried, supporting the proposal that this area should be set apart as a fauna and flora reserve, and the resolution was sent forward to New South Wales. I well remember the late A. J. North, the Ornithologist at the Australian Museum, replying, that it was no good, as there was no interest in such proposals, and it was altogether too much trouble. On the occasion of my recent visit to that State, I met a man who knows Mallanganee well, and he told me that the chief beauty of that locality has now gone, and, in his opinion, with but little, if any, profit to the pioneer settlers. We have by such neglect robbed posterity of a great heritage. We as a Union need to guide bird protection societies and bird lovers from the region of much ineffective talk, into practical methods along the lines outlined.

In order to turn this discussion to some practical purpose, I move:—

- (1) That our official representatives in each State be requested to take the necessary steps to ensure that the resolution respecting preserves passed last year, be adopted as part of the policy of each of the State Governments, and report what has been done to next Congress.
- (2) That a small committee be appointed to work out some recommendations which have for their object the preservation of unburnt blocks of scrub in all districts where bush exists. (At the present time no harm is thought of putting fires through Government lands, thereby destroying fauna and flora, which cannot be replaced, and which we are under obligation to preserve for those who come after us.)

Sonnerat's Voyage to New Guinea.

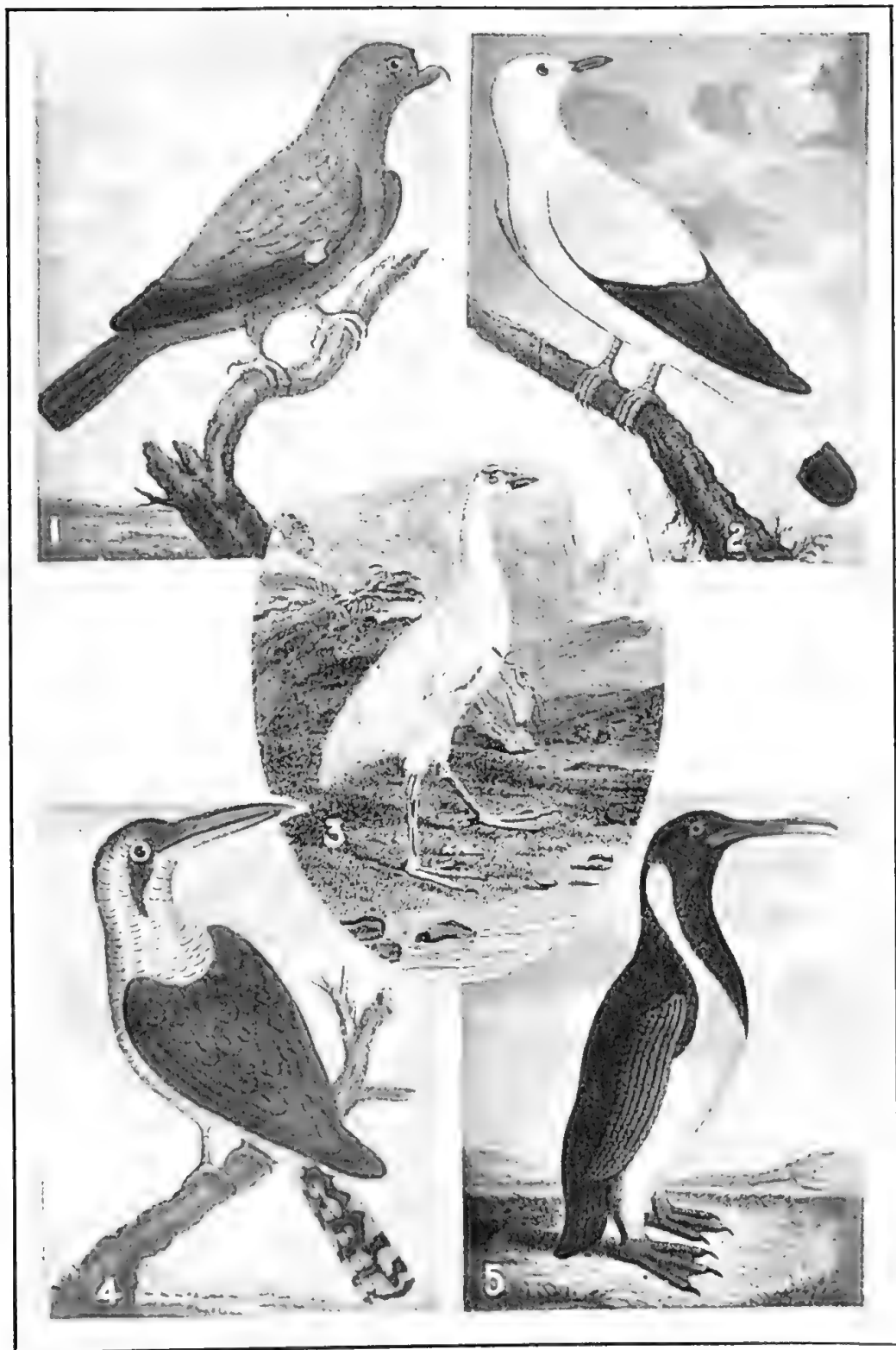
By W. B. ALEXANDER, M.A., C.F.A.O.U., Sherwood,
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One of the earliest naturalists to visit the Australian region was the Frenchman, M. Sonnerat. As far as the writer is aware, the only prior visitors who deserve the name of naturalists were William Dampier, in 1689 and 1699, and Joseph Banks and Daniel Solander, who, as is well known, were on board the "Endeavour" on Captain Cook's first voyage, 1769 to 1771. Since Banks and Solander never published an account of their discoveries, and it was only gradually that descriptions of the new animals, birds, and plants obtained by them were published by other writers, Sonnerat seems to have been the first author to describe and figure many of the characteristic birds of the Australian region. The account of his voyage was published in 1776, at Paris. The title-page bears the following legend* :—I : Voyage to New Guinea, containing descriptions of places, physical and moral observations, and details concerning the natural history of the animal and vegetable kingdoms. By M. Sonnerat, Sub-Commissary of the Navy, Naturalist, Pensioner of the King, Correspondent of his Cabinet, and of the Royal Academy of Science at Paris, Associate of the Academies of Science, Fine Arts and Letters of Lyons. Illustrated with one hundred and twenty figures. The frontispiece shows us the author at work. He is seated under a palm-tree, with a large sheet of paper on his knees, making a drawing of a parrot on a perch, to which it is attached by a chain. Evidently it is a tame bird, and it is held up for him by an almost naked female native, with a child in her lap. Behind M. Sonnerat are two male natives, scantily clad, one of whom holds a banana leaf over the artist's head, whilst the other watches the drawing with interest. On the ground in the foreground lie a snake in a glass jar, a large lizard, and two birds.

The preface informs us that M. Poivre, Governor of the Isles of France and of Bourbon (now called Mauritius and Bourbon), had long been anxious about obtaining supplies in case of a war, and in the year 1769 he sent out the Royal Flute, "Isle of France" and the Corvette "le Nécessaire," under the command of the Chevalier de Coetivi, to explore the Philippine Islands and the Lands of the Papuans. Sonnerat sought and obtained permission to accompany the expedition. He tells us that his sole motive was the desire to travel in countries so rarely visited, where the men, animals and plants and every aspect of nature present to the observer a novel spectacle.

*The work is, of course, in French, but I have translated passages quoted.—W.B.A.

The expedition sailed from Port Louis, Mauritius, on June 29th, 1771, Sonnerat being on board the "Isle of France," which had a crew of 190 men and 24 guns. They first visited the Seychelles, where Sonnerat made drawings of the remarkable double cocoanut of Praslin Island. Thence they proceeded to Luzon, in the Philippines, which was reached on Sept. 3rd. From Manilla, the capital, Sonnerat made an expedition into the interior. His account of Luzon is illustrated by figures of many trees and fruits, and in a chapter on the birds he describes 41 species. Leaving Manilla on Dec. 29th, they reached Antigua, in the island of Panay, on Jan. 7th, 1772, and spent a week there. From this locality 20 birds are figured and described. From Antigua, the expedition proceeded to Zamboanga, in Mindanao, which port they left on Feb. 9th. From this point onwards the route of the voyage becomes somewhat obscure, since "for special reasons," the names of the localities visited are not mentioned. The special reasons were certainly due to the fact that the rest of the cruise was in the region in which the Dutch endeavoured to maintain their monopoly of the spice trade, and this official French expedition, which was designed to promote trading relations with the Moluccans and Papuans, would obviously be regarded by the Dutch as an intrusion. The details given by Sonnerat enable us, however, to follow the route of the vessels fairly accurately. About Feb. 15th they sighted the volcanic island of Siao, to the north-east of Celebes, and passed close to it; then leaving Gilolo, in the distance, they passed through a strait to the north of the island of Aby (probably Oby, one of the Moluccas). On Feb. 20th they anchored off an island whose name is not mentioned. The chief of the nation inhabiting the island directed them to a secure anchorage, which was only reached three days later, thus indicating that the island was of considerable size. It was certainly one of the Moluccas. Sonnerat mentions that their object was not to remain in this archipelago, but to make discoveries in the direction of the lands of the Papuans; accordingly, on March 2nd, they continued on their voyage, and on March 15th reached another island, whose name is not mentioned, but we are told it was "one of the islands inhabited by Papuans." The Papuan chiefs promised the commandant all the supplies he desired, and in consequence he decided to remain here, and formed an encampment on shore. Whilst negotiations were being carried on, the natives began trading with the sailors, among the articles offered being "lories, species of beautiful red parrakeets." Sonnerat devotes a chapter to the description of some New Guinea birds. All of them but two are described as either "Papuan" or "of New Guinea," the exceptions being the Lory of Gilolo and the little Lory of Gueby. The mention of the former bird is one of my reasons for suggesting that Gilolo was the large Molucca island along which they coasted, and it seems probable that the Papuan island



1. The Red-sided Parrot.
2. The Nutmeg Pigeon.
3. The White Fulica, from White's Journal (see *ante*. pp. 214, 215.)
4. The Laughing Kookaburra
5. The King Penguin.

Figures 1, 2, 4, 5 from Sonnerat's Voyage
Figure 3 from White's Journal

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at which their journey terminated was Gaby, which lies to the west of Waigiou, off the north-west end of New Guinea.

During their stay at this island the French received visits from several chiefs or princes of the neighbouring islands. Among these were the Sultan of Tidore, one of the chief potentates of Gilolo, the King of Patania (probably Batchian), and an ambassador from the Emperor of Salvati (Salawatty). A glance at the map will show that if the island at which they encamped was not Gaby, it cannot have been far away.

In his remarks on the Papuans, Sonnerat tells us that it is in the land inhabited by these savages that nature has placed her rarest, most precious, most singular and most brilliant productions, judging by the small number of them which these same men offered us. They presented us with several species of birds as elegant in form as they were brilliant in colour, also several kinds of those precious trees which furnish spices. The spoils of the birds provide apparel for the chiefs, who wear them attached to their headgear in the form of aigrettes, but in preparing the skins they cut off the legs. The Dutch, who trade on these coasts, buy their skins prepared in this way, and transport them to Persia and Surat in India, where they sell them at high prices to the rich inhabitants, who make from them aigrettes for their turbans, and for the helmets of their warriors, and who decorate their horses with them. The opinion has thence been formed that one of these species of birds (the bird of Paradise) has no feet, that it rests by hanging itself up by two long filaments, which adorn its tail, and that it incubates its eggs by carrying them under its wings. The Dutch have accredited these fables, which, by rendering marvellous the object which they have to sell, made it more precious and thus enhanced its value."

Turning now to the birds which Sonnerat figured and described, we shall first deal briefly with the 61 which he describes as met with in Luzon and Panay, in the Philippine Islands. Of those which I have been able to identify, at least 32 are actually found in those islands, but 8 are species found in South Africa, two occur only in South America, and several others are inhabitants of tropical Asia, not found in the Philippines. Of three of the South African species, Sonnerat himself mentions that they are found at the Cape of Good Hope, as well as in the Philippines, though the latter part of his statement is incorrect. He also mentions that the two South American species are found in that country, as well as in the Philippines. How it came about that birds from these other localities were mixed with his Philippine birds it seems now hopeless to enquire.

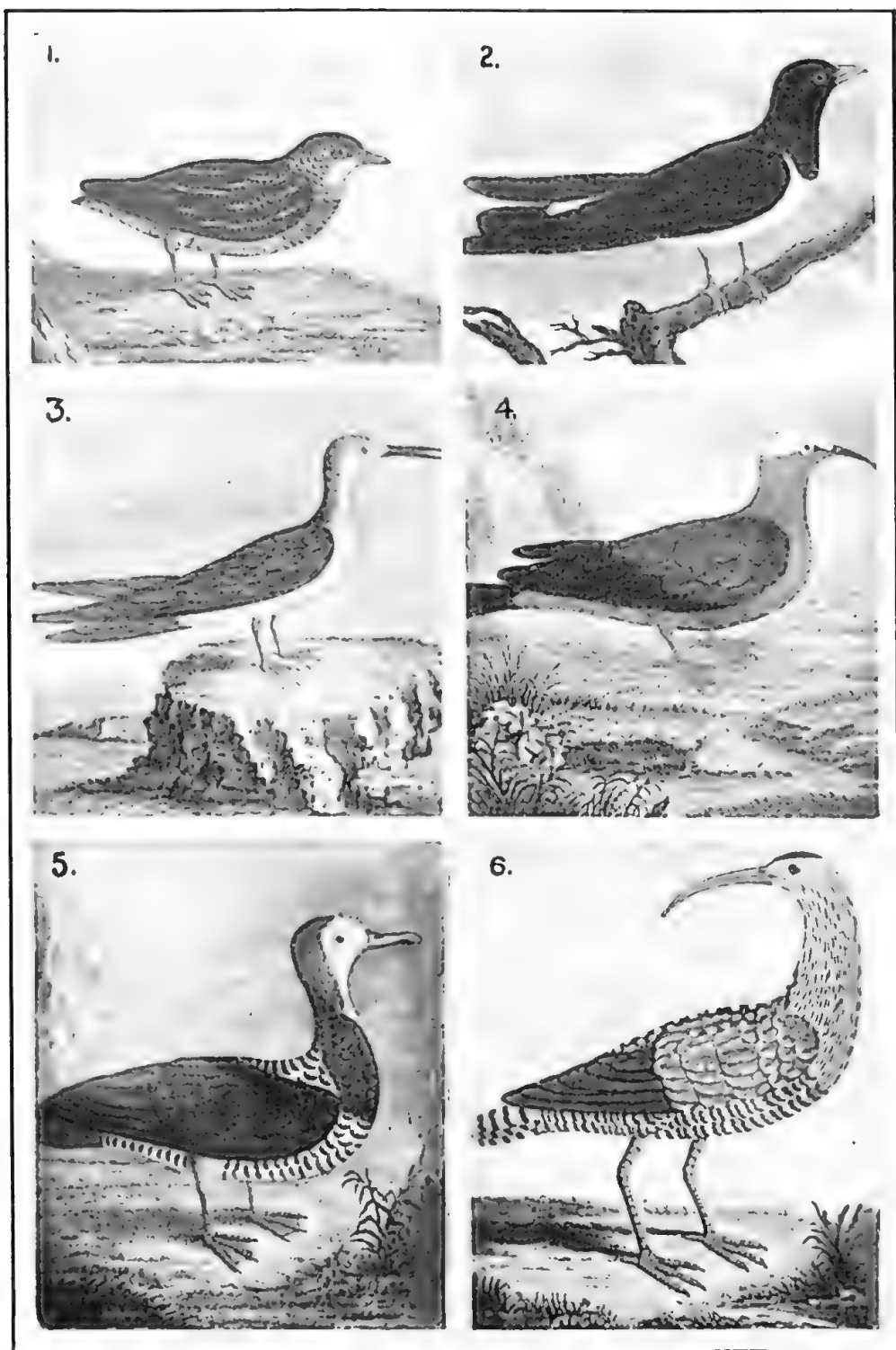
Among the genuine Philippine birds which he figures and describes, 7 occur also in Australia, and these early figures of them, 6 of which are here reproduced, are therefore of special interest to readers of *The Emu*. The 7 species in question are:—

White-rumped Wood Swallow (*Artamus leucorhynchus*),
Mangrove Kingfisher (*Halcyon chloris*),
Eastern Whimbrel (*Numenius phaeopus variegatus*).
White-quilled Goose-Teal (*Nettapus coromandelianus*),
King Quail (*Excalfactoria chinensis*),
Brown-winged Tern (*Sterna anaethetus*), and
Noddy Tern (*Anous stolidus*).

The Brown-winged Tern, of which the figure shows an immature specimen, was described as the Sea-swallow of Panay, and thence derived the name of Panayan Tern, a name often used for it in Australian books. The only bird as to which there is any information beyond the description is the White-rumped Wood Swallow. Sonnerat states that "this bird has a rapid flight, and balances itself in the air like the swallows. It is an enemy of the crow, and though much smaller, it dares not only to fight it but even to provoke it. The combat is long and stubborn, sometimes lasting half an hour, and ends in the retreat of the crow; perhaps he scorns such a feeble enemy, which only worries him, and only escapes his blows by the ease with which it avoids them, making itself scarce and returning when it sees its advantage."

There can be no doubt that this bird at any rate was observed by Sonnerat alive in its natural surroundings. The White-rumped Wood Swallow is a bold species when the nest is approached, and I have myself watched them attacking crows and sea-eagles which ventured near the mangrove trees where they were nesting on Stradbroke Island, Moreton Bay.

It is probable, however, that most of the birds which Sonnerat drew and described were either skins purchased from the natives or tame birds in their possession. As we have seen, the frontispiece shows him making a picture of a tame parrot on a perch. It seems practically certain that the birds he described from New Guinea were all, or almost all, brought to him by the natives. Their distribution, as now known, shows that they could not all have been obtained in one spot, and we have already seen that birds and their skins were amongst the chief articles of trade of the region. This was still the case at a much later period, as readers of Wallace's account of Dobbo, in "The Malay Archipelago," will remember. Of this famous trading centre, towards the end of its annual fair, he wrote: "Piles of firewood were being heaped up behind the houses; sail-makers and carpenters were busy at work; mother-of-pearl shell was being tied up in bundles, and the black and ugly smoked tripang was having a last exposure to the sun before loading. . . . Parrots and lorries and cockatoos, of a dozen different kinds, were suspended on bamboo perches at the doors of the houses, with metallic green or white fruit-pigeons, which cooed musically at noon and eventide. Young cassowaries, strangely striped with black and



1. The King Quail.
3. The Brown-winged Tern.
5. The White-quilled Goose-teal.

2. The White-rumped Wood-swallow.
4. The Noddy Tern.
6. The Eastern Whimbrel.

Figures from Sonnerat's Voyage.

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brown, wandered about in the houses or gambolled with the playfulness of kittens in the hot sunshine."

Now we know from the accounts of the early explorers of the northern parts of the Australian coastline that Malay praus regularly visited that coast for trepang and mother-of-pearl. Since birds were also valued as objects of trade, it is highly probable that occasionally Australian birds were captured and taken back to the Moluccas as pets, or for sale. When we turn to the list of birds described by Sonnerat as obtained in New Guinea, we actually find an Australian bird included among them.

I give here the list of species figured and described by Sonnerat, with their scientific names and distribution. It should be noted that he expressly states that the birds of Paradise were procured for him by the Papuans, though the other species are referred to as observed in New Guinea. The first name given in each case is that used by Sonnerat:—

1. Bird of Paradise. *Paradisea apoda* (Linn.). Aru Is.
2. King of the Birds of Paradise. *Cicinnurus regius* (Linn.). New Guinea, Western Papuan Is. and Aru Is.
3. Violet-throated Bird of Paradise. *Lophorhina atra* (Bodd.). N.W. New Guinea and Waigiou.
4. Golden-throated Bird of Paradise. *Parotia searpennis* (Bodd.). N.W. New Guinea.
5. Magnificent Bird of Paradise. *Diphyllodes speciosa* (Bodd.). N.W. New Guinea, Mysol and Salwatti.
6. Green Bird of Paradise. *Manucodia viridis* (Linn.). New Guinea, Waigiou, Salwatti, and Aru Is.
7. Brown New Guinea Promerops. *Epimachus maximus* (Scop.), female. New Guinea.
8. Great New Guinea Promerops. *Epimachus maximus* (Scop.), male.
9. Copper-coloured nutmeg-eating Pigeon. *Globicera myristicivora* (Scop.). W. New Guinea, Mysol and Waigiou.
10. White nutmeg-eating Pigeon. *Myristicivora bicolor* (Scop.). Malayan and Papuan regions, and N. Australia.
11. Crowned Pigeon, or New Guinea Goura. *Goura coronata* (Linn.). W. New Guinea and Western Papuan Is.
12. New Guinea Quail. Not identified.
13. Great New Guinea Kingfisher. *Dacelo gigas* (Bodd.). E. Australia.
14. New Guinea Kingfisher. *Choucalcyon gaudichaudi* (Quoy and Gaim.). New Guinea and Molucca Is.
15. Large green New Guinea Parrakeet. *Lorius pectoralis* (Müll.). New Guinea, Molucca Is., and N. Queensland.
16. Little Gaby Lory. *Eos wallacei* (Finsch). Waigiou and Gaby.
17. Black New Guinea Lory. *Chalcopsittacus ater* (Scop.). W. New Guinea, Salwatti, and Mysol.
18. Little Papuan Lory. *Charmosyna papuensis* (Gmel.). N.W. New Guinea.
19. Gilolo Lory. *Eos rubra* (Gmel.). Molucca Is.
20. New Guinea Penguin. *Aptenodytes patagonica* (Forster). Subantarctic Islands.
21. Collared New Guinea Penguin. Named *Aptenodytes torquata* by Forster, but does not agree with any known bird.
22. Papuan Penguin. *Pygoscelis papua* (Forster). Subantarctic Islands.

Sonnerat's figures of Nos. 10, 13, 15, and 20, which occur in Australia, are reproduced herewith.

The last three birds on the list, the Penguins, two of which are well known species inhabiting the sub-antarctic islands, and the third not identifiable, present a problem like that supplied by the mixture of African and American forms among those described from the Philippines. In the text Sonnerat does not state that these birds came from New Guinea, but the names attached to the pictures imply that they did.

The matter of greatest interest to Australians, however, is how our well-known Kookaburra found a place in Sonnerat's collection, since the only known visitors to the regions of Eastern Australia inhabited by this bird were Captain Cook and his fellow-voyagers on the "Endeavour," about two years before. That the bird figured and described is actually a Kookaburra there is not the least doubt. I give here a translation of Sonnerat's description:—

"The two Kingfishers which I observed at New Guinea are much larger than the largest species of this genus hitherto known. The first is as large as the Hooded Crow of Europe. The top of its head, the nape, the neck, the back and the wings are dull brown; a patch of the same colour extends on the cheeks to beyond the eye, and ends in a point; the sides and front of the neck, the breast, and the under parts are dirty white, crossed by black waves or rays; the tail, much longer than the wings, is composed of twelve brown feathers, crossed by black waves or rays, and these feathers are tipped with dirty white. The upper mandible is blackish, slightly hooked, and hollowed at the sides at its tip. The lower mandible is yellowish, the feet grey."

The description of the dark mark on the cheeks, also shown in the figure, excludes the possibility that the bird described was the form of *Dacelo leachi*, which occurs in New Guinea, since there is no such mark in any form of that species.

I think, therefore, that the explanation I have already suggested, that the bird had been brought back by Malay trepang-fishers from the coast of Australia; is the only possible one. This suggestion has been made before, and is discussed by Mathews, in his "Birds of Australia" (vol. 7, p. 120). He wrote, "at the time Sonnerat travelled East Australia was not known to Europeans, and this species does not occur in the north, with which the Malays were in contact." Eight pages later he quotes from Macgillivray that "Mr. Wheatley found this species nesting in Termites' nests, high up in the trees, near the Batavia River." The Batavia River is on the west coast of Cape York, and Mr. Mathews has himself named a subspecies *Dacelo gigas watsoni* from the Watson River, not many miles away, whilst North had previously named a form from Cape York *Dacelo maclennani*. How Mr. Mathews could write that a bird of which he considers

there are two subspecies in Cape York is not found in the north of Australia I fail to understand.

My conclusion is that Sonnerat's bird probably came from Cape York, and that the scientific names based on Sonnerat belong to the smaller northern form, whilst the larger southern race was first described by Latham as the Great Brown Kingfisher, from specimens brought back by Sir Joseph Banks. On turning to Latham's account ("General Synopsis of Birds," vol. 2, p. 609) we find confirmation of this. His description of the Great Brown Kingfisher begins: "This is the largest species yet known, and is in length eighteen inches." After describing two individuals supposed to be the male and female, he concludes: "Both the above-described are in the collection of Sir Joseph Banks, and are said to have come from New Guinea; from whence Sonnerat had the bird figured by him. The only difference seems to be that the under mandible in his was orange, and the bird only sixteen inches in length."

Mathews recognises 5 subspecies of *D. gigas*, 3 from North Queensland, one from South Queensland and New South Wales, and one from Victoria and South Australia. If the foregoing views are adopted the name *Dacelo gigas gigas* (Boddaert) will have to be transferred to one of the North Queensland forms, whilst the New South Wales forms will become *Dacelo gigas gigantea* (Latham). If Herrman's name *Alcedo novaeguineae* is earlier than Boddaert's, as Mathews states ("Austral Avian Record," vol. 4, p. 112), then the name for the northern race will be *Dacelo novaeguineae novaeguineae* (Herrman), and for the southern one *Dacelo novaeguineae gigantea* (Latham). This change of name, whilst distinctly unfortunate, will at least serve to remind us that Malays from the neighbourhood of New Guinea probably made the acquaintance of the Laughing Jackass before the first white men had landed in eastern Australia.

The central figure of plate 53 is the illustration of the White Fulica, from White's *Journal of a Voyage to New South Wales*, plate 27. It was referred to on pages 214-215 of our last issue. The "crooked spine"—the spur referred to—is plainly seen on the right wing.

Goshawk Preys on Kestrel.—A few weeks ago I saw an Australian Goshawk (*Astur fasciatus*) swoop down into a creek-bed carrying a large bird in its talons. I quickly got to the spot and flushed the Hawk, when it released its prey. I picked up the bird, and found it to be a full-sized specimen of the Nankeen Kestrel (*Cerchneis cenchroides*), which, though quite dead, was bleeding still. I am not aware of this having been previously recorded, and it struck me as strange that this Kestrel should be picked out for a meal when the bush was teeming with smaller birds of various descriptions more easily seized.—J. N. MCGILP, King's Park, Adelaide.

Birds of the Broome Hill District.

By TOM CARTER, M.B.O.U., Sutton, Surrey, England.

Part III.—continued

Calamanthus montanellus carteri. This subspecies of the Rock Field-Wren was common on the scrubby sandplains to the east of Broome Hill, but does not occur in dense forests. On Nov. 3/07, I first saw any of these birds (a few miles east of the railway), where they were quite numerous, and on Aug. 28/08, the first authenticated nest and eggs were found, of which a detailed account was published in "The Emu," Vol. VIII., pp. 97-98, and I will not repeat fully here. The nest was situated in a rather bare patch of ground surrounded by thick scrub up to ten feet in height. I saw the bird creeping away towards this scrub, but could not be sure from where it started, so, being afraid of treading on the nest, went away for about an hour, and on returning to the place the bird seemed to "twist" away from an almost bare piece of ground, and stooping down, I saw the entrance to the nest, level with the ground surface. The entrance faced north, and the domed nest was built in a slight hollow, as of a horse's footprint. The nest was round, about four inches in diameter, and was loosely made of coarse dry grass, interwoven with some dry leaves and old flower heads and stalks. It was well lined with feathers, amongst which were many blue, green and red ones from Parrots; it contained three eggs. Nov. 1/08, saw many fledged young on the sandplains; Aug. 28/10, found a nest with two incubated eggs, and with them one of the Fantailed Cuckoo (*Cacomantis flabelliformis*), in sandplain scrub; March 16/10, saw several of these Field-Wrens in the course of a long drive across sandplain country east of Cranbrook; Sept. 25/10, caught three recently fledged young on a sandplain near the Pallinup River, being the full brood; Feb., 1919, I saw a good many on scrubby land about twenty-five miles east of Broome Hill; March 5/22, observed a male bird, that was undoubtedly breeding, near Gnowangerup, and a few days afterwards saw many of these birds, ten miles farther east. A good many small birds were breeding at that time (although most of them were moulting), as heavy rain had fallen a short time previously. The Rock Field-Wren, as well as all other varieties of this genus that I have seen, has the same habit of uttering a pretty song from the top of a bush, and, when approached, of diving down to the ground and rapidly running some distance to other shelter.

Calamanthus montanellus leakei. This recently described subspecies first attracted my notice on the scrubby sandplain country near Woolundra, in May, 1919, but the birds were so extremely wary that I did not obtain any specimens. However, on revisiting the same place in March, 1922, I obtained a few, but I walked a great many miles in doing so. Their habits and song are similar to those of the rest of this genus. The male birds showed signs of breeding, as other small birds were also doing at that time.

Cinclorhamphus cruralis clelandi. Western Brown Song-larks were occasionally seen and heard about Broome Hill, but they were not numerous, probably owing to most of the land then being under grass, and will, no doubt, increase when there is more cultivation. On Jan. 2/07, I obtained a specimen for identification.

Cinclorhamphus mathewsi mathewsi. Western Rufous Song-larks were seen by me only on one occasion at Broome Hill, when I saw a pair on Oct. 12/13. I tried to obtain a specimen for identification, but failed. As this bird was well known to me in the North-West, I cannot think that I was mistaken. They

occur regularly in the mid-west, and specimens have been obtained south of Perth.

Epthianura albifrons westralensis. Western White-fronted Chats were common and resident through the South-west area. Nests with eggs were found from mid-July to mid-December, so probably two broods are sometimes reared. I have the following data from Broome Hill:—Aug. 14/06, nest with three eggs in a bunch of rushes; Aug. 19/06, another nest containing young, in a similar site; Sept. 26/06, nest with three eggs; Dec. 11/06, nest with three fresh eggs; July 5/10, saw the first White-fronted Chat of this season; they were very seldom seen in 1910 for some reason; July 17/10, three fresh eggs in a nest made of fine grass, and built three feet above the ground in a prickly Banksia bush; Oct. 9/10, nest with fresh eggs; Aug. 21/12, nest with three eggs; Oct. 13/12, bird sitting on three eggs; March, 1919, very few of these birds were seen anywhere in the South-west by me, excepting a small party at Lake Muir on March 21; and a good many on a large bare sand-drift at Cape Naturaliste on April 13/19; they were unusually wild, and no specimens were obtained; Jan. 27/22, a few seen on the coast near Yallingup; these active little birds run along the ground at a great speed, and constantly utter a metallic, double note, from which they were locally known about Broome Hill as "Tin Tacks." In Jan., 1905, they were abundant about Albany, and local gardeners complained of their eating many currants from the bushes.

Megalurus gramineus thomasi. Dark Grass-Birds were most abundant along the edges of the large freshwater lagoons close to Lake Muir. They first came under my notice there on April 24/11, when I obtained a few specimens, and found that two of them were recently fledged young; some adults were in full moult at the same time. These birds kept mostly to the edges of the freshwater swamps in the usual growth of long coarse grass, rushes and sedges, and were only occasionally seen in the reeds growing out of the water. Their song is a faint high-pitched "Pee-pee-pee-e." I revisited the place in Jan., 1916, and saw few of these birds; but in mid-March, 1919, they were fairly abundant, and seemed to have been recently breeding. On March 29/19, I saw some on the Lower Warren River. Early in April the same year, Mr. J. Higham and myself saw several along the margins of some large freshwater swamps at Augusta, and noticed that specimens obtained there differed from Lake Muir birds by having fulvous yellow under parts, where the Lake Muir birds were white. These birds are quiet and tame in disposition, creeping about in long grass close to my feet, as long as I remained still.

Acanthiza inornata mastersi. The South-western Thornbill was commonly seen in the South-western districts, including Albany, Lake Muir, Warren River, Blackwood River, Augusta, and Collie, but not about Broome Hill. I have no breeding data, as my visits to the above localities were mostly in the summer months. It is a very quiet, unobtrusive little bird.

Acanthiza apicalis. Broad-tailed Thornbills were common about Broome Hill and all the South-western area, going about with their tails erect and constantly uttering a rather loud double note. They frequented low scrub, and the thick growth of "suckers" that often spring from the base of trees after they have been "ring-barked." Sept. and Oct. are the main breeding months, and I append notes made around Broome Hill. Sept. 4/08, nest with three eggs, two feet above ground in small Marlock scrub; nest, four inches in height, three inches width, with an entrance one inch in diameter. The materials were coarse grass, strips of bark and some sheep's wool, and it was neatly lined with fine silver grass and feathers; several white cocoons of some spider were woven on the outside of the nest; Oct. 28, nest with three fresh eggs, which

seems to be the full clutch; Nov. 1, nest with one egg, and also one of Bronze Cuckoo; Oct. 21/12, nest, eighteen inches above ground, with two small young. Many green feathers of Parrots were worked in around the nest entrance. I observed several nests of these birds that had been robbed by the large lace lizards (*Varanus varius*) that were plentiful, and locally known as Gohannas: and I once caught one of them in the act of eating the eggs.

Geobasileus chrysorrhous multi. Yellow-tailed Thornbills were abundant in all districts, building their bulky, and often double nests, in scrub and low trees. Old nests were sometimes repaired and used again; three or four eggs are laid from Aug. to the end of year. Oct. 7/06, nest with four fresh eggs; Aug. 16/07, nest with four fresh eggs; Sept. 4/08, small young in nest; Dec. 12/11, nest with three eggs about twenty miles west of Mount Barker. The following nests were at Busselton:—Nov. 6/02, nest with two eggs; and Dec. 8/02, nest with four eggs.

Smicrornis brevirostris occidentalis. Western Brown Weebills (Tree-Tits) were common about Broome Hill and the scrubby sand plains east of there, but were not so much in evidence in the denser forests, probably owing to their keeping high up in the trees. Nov. 6/10, I obtained a recently fledged bird; Feb. and March, 1919, I observed them as numerous about Broome Hill and Gnowangerup, especially in the Marlock and Mallee scrubs, as they also were when I was there in 1922. March 3/22, I watched a pair of these birds building a nest in a clump of large "suckers" that had grown up from the stump of a White Gum tree that had been cut off a few feet above the ground, and were then about thirty feet in height. The nest was about twenty-five feet from the ground in a thick bunch of pendent gum leaves. I visited the place again on March 13, and found three eggs, slightly incubated, in the nest, which was domed, with entrance near the top, and very neatly made of dry grass, fibre and bark, interwoven with some cotton-like materials that seemed to be cocoons of some sort. (I narrowly escaped a bad fall in examining this nest, as one of the treacherous suckers, on which I had to put all my weight, split off the old stump just as my hand reached the nest, which was in the top twigs of another sucker, necessitating a long reach across to it.)

Ethelornis fuscus (= *culicivorus*). Mathews, "Bird of Australia," Vol. VIII., p. 170; (*Gerygone culicivora*. R.A.O.U.'s Check List). Southern Warblers or Fly-eaters, were common in all districts mentioned in these notes. I have no breeding data, but a note that they were numerous about Lake Muir in March, 1919. They have a faint, but sweet note, that the residents of the South-west interpret as "Sle-ep ba-bee" (Sleep baby). The Spotted Pardalote has a similar "song."

Sericornis maculata warreni. Warren River Scrub Wrens were seen in several South-western coastal districts, as at the Warren River, where they were fairly common in March, 1919. Mr. Mathews separated them under the above name, as they differed from the birds originally described by Gould in 1847, from Albany. In April, 1919, I found these birds fairly common about Augusta, Cape Naturaliste and Busselton, and a few were seen near Collie, about twenty-five miles from the coast. In January, 1922, I saw some near Cape Naturaliste in coastal scrubs. During my nine years' residence at Broome Hill I only once saw any, viz., on Sept. 21/10, when a pair were creeping about in a heap of dead timber. Once only I saw a pair at the Pallinup River, about twenty-five miles east of Broome Hill, and ninety miles from the coast, the farthest inland locality where I have seen any. The last mentioned birds in Broome Hill area may have been *Sericornis maculata maculata*,

of which I observed a few near Albany in Feb., 1905, and also on March 10/05, when I obtained one. I have no breeding data. In habits these birds are quiet and unobtrusive.

Malurus splendens. Splendid Wrens are common through the South-West area, especially the coastal districts, but were not nearly so numerous around Broome Hill. They were exceptionally abundant about Busselton (Vasse River), but in recent visits there I did not see nearly so many; in Jan., 1922, they were really scarce within a mile or two of the town. I think this can be attributed to domestic cats. The farthest easterly locality at which I have seen any of these Wrens was ten miles east of Gnowangerup, on March 9/22, but that is also as far as I have been in that direction, up to the present time. The first nest I ever found was in Jan., 1887, near Busselton. It was about one foot above the ground in a small bush, and contained four young birds almost full-grown. The following notes were made about Broome Hill:—Oct. 7/06, nest with four fresh eggs; Aug. 21/12, nest with three eggs. Full plumaged males were seen Jan. 25/07, Sept. 4/08, Aug. 20/10, Sept. 27/10, and Nov. 12/10. In the vicinity of Busselton and Cape Naturaliste, full-plumaged males were observed in Jan., 1887, Feb., 1916, and many so in Jan. and Feb., 1922. Feb. 5/22, I saw a family party of these Wrens feeding upon small insects that they caught from some horse droppings on a road near Busselton. The time was after sundown, but there was no mistaking the birds, as I had been watching them for a few minutes previously, as they fed in some bushes on the edge of the road. I have observed these Wrens feeding in trees thirty feet, or more, above the ground.

Malurus elegans warreni. Mr. G. M. Mathews made a new subspecies of the Red-winged Wren from the Warren River district, as specimens obtained there by me in 1910 differed from those that occur in the Swan River (Perth) district. These birds were never seen anywhere near Broome Hill, but I have seen them in many coastal swamps from Albany to Busselton, and also about forty miles inland on the Blackwood River. I do not recollect having ever seen any away from the vicinity of swamps or running brooks. In 1905 and several succeeding years, they were common round Albany, and I spent many hours watching them in a swamp, within half a mile of the town, but that has long since been drained and turned into a potato and vegetable garden. I saw a good many about the Warren River in 1910, and a few at Augusta in April, 1919, but I am afraid that these charming little birds are not so numerous as in former years. I have no breeding data, but a note that when feeding, they move along quickly, and often at a considerable height in the Paper-bark (*Melaleuca*) and other swamp vegetation.

Malurus pulcherrimus stirlingi. South-western Blue-breasted Wrens are distinctly rare, and were seen only on two occasions, and in the same locality, viz., about twenty miles north of the Stirling Ranges, where the type of this sub-species was obtained, so I presume that my birds were the same. Aug. 28/08 was the date when I first had the pleasure of seeing any of these well-named birds, on scrubby sand-plains a few miles east of Broome Hill; they were wild and shy. Feb. 16/19, I saw a family party of five, also in scrubby country, some miles farther east than the above. They also were very wild, but two specimens were obtained; they were in full moult, as appeared to be the case with the rest of them.

Stipiturus malachurus westernensis. Western Emu-wrens were fairly common in South-West coastal areas; I have two notes that many were seen about Augusta in March, 1916, and at Cape Leeuwin (four miles from Augusta) in Feb., 1919. They were also fre-

quently seen in 1905, in the numerous swamps that were then in existence near Albany, and also round the Harbour. On Jan. 15/10, I shot one 7½ inches in total length, or about 180 mm., which equals the greatest length given by Mathews for any Emu Wren, viz., the type male of *Stipiturus m. hartogi* collected by myself in 1916. I have no breeding data.

Stipiturus malachurus medius. On July 26/08, I obtained a male of this sub-species on a sand-plain a few miles from Gnowangerup. It was one of a small party and they were exceedingly wild, taking long flights from one patch of low scrub to another. After a long chase, one of them fell with a broken wing. I was accompanied by an elderly stout gentleman, who had driven me out, with his son, on purpose to try and identify these birds, which they had previously seen, but did not know. The son at once began to chase the injured bird, on foot, from one bush to another, but it easily eluded him, dodging about below the scrub, and then darting to another bush with extraordinary speed and bounds. Then I went to help him, and the pair of us continued the "hunt" without success. Then the old gentleman got down from the buggy, and joined us, and eventually we caught the bird. The old gentleman was decidedly blown, and taking off his hat to mop the perspiration from his head, said: "Well, now, if anyone had told me that I would ever get excited over chasing 'mosquitoes,' I would not have believed him." During the above episode, the rest of the Wrens had, of course, disappeared, and could not be found again. The skin of the captured bird was afterwards sent, in a parcel of others, to Mr. Mathews, who overlooked the fact that it was a new variety. I saw no more of these birds until Feb. 12/19, when several small parties of three to six were seen in similar country a few miles from the above locality, and some specimens were obtained from which the type bird was described by Mr. G. M. Mathews. Bull. B.O.C., Vol. XL., p. 45. The "sand-plain" country, upon which this sub-species has so far only been observed, is usually quite dry, and devoid of any surface water, as rain usually soaks in as fast as it falls, which is not very frequently. I think it is probable that the "Emu Wren" I obtained on sand-plains east of the Vasse River on Dec. 6/02 was this sub-species. (*Vide* "Emu," Vol. III., pp. 38, 39.)

Sphenura longirostris. Western Bristle-birds will, I fear, soon be extinct, as they apparently are now, in localities where they were not uncommon, but rarely seen, twenty years ago. As the length of coast along which they have been known to occur, at long intervals, is more than three hundred miles, and the dense coastal scrubs are still intact in many places, it is possible that some still survive in remote situations.

Sphenura broadbenti litoralis. The Lesser Rufous Bristle-bird was originally discovered and named by my old friend, the late A. W. Milligan, R.A.O.U., who gave it specific rank as *Sphenura litoralis* in his original description of it in "The Emu," Vol. 1, p. 67, but Mr. Mathews, in his "Birds of Australia," Vol. X., Part 3, p. 164, reduced it to a sub-species, and it is this bird to which my notes in "The Emu," Vol. III., p. 39, refer, and I here beg to correct a mistake that was made in the ninth line from the bottom of that page 39, where, instead of **Black-throated Coachwhip Bird**, it should read **Lesser Rufous Bristle-bird**. I revisited the same locality in March, 1916, 1919 and 1922, where Mr. Milligan and myself had seen these Bristle-birds in 1901 and 1902 respectively, and found that where there had been dense impenetrable scrub, was mostly bare sand drifts caused by fires made to improve the country for cattle grazing. No doubt it was a great improvement from the graziers' point of view, but there was also no doubt but that many *Sphenura*, *Psophodes*, and other birds, had perished at

the same time, and will perish in the same way in future, their total extinction being also hastened by domestic cats in a wild state, which are becoming increasingly numerous in all districts.

Diaphorillas textilis varius. The type specimen of the Varied Grass-Wren was obtained at Broome Hill, on June 6, 1908, and described by me in "The Victorian Naturalist," Vol. XXV., pp. 75 and 76, as *Amytis varia*. A full account of obtaining it was published in "The Emu," Vol. VIII., p. 103, and another note respecting it appeared in "The Emu," Vol. IX., p. 163. Mr. Mathews, in his "Birds of Australia," Vol. X., Part 3, makes it a good sub-species. On Oct. 19/08, I obtained one of these birds from a party of six that were met with in Marlock scrub east of Broome Hill; on Sept. 1/10, another specimen was obtained in the same locality by chasing it until it ran into a hole at the base of a tree trunk, and was caught alive. The above being the only occasions on which these birds were seen, they may be considered as rare. Local aboriginal name is Tcher-ree.

As the parts of Mathews' "Birds of Australia" containing the following birds have not yet been published, I shall name the subspecies from his 1913 list.

Artamus personatus. Masked Wood-swallows were fairly common about Broome Hill in the summer months, and occasionally came in great numbers, notably so in 1912 and 1916. They usually appeared about mid-November, and disappeared in January, after rearing their young. I have no notes of seeing any in the extreme South-west, so the following refer to Broome Hill:—Dec. 8/06, several seen, and nest with three eggs found; Nov. 12/12, several seen, and on Nov. 17 large flocks appeared, and at once commenced building operations; Nov. 22/12, nest with two eggs on the top* of a dead tree stump, about nine feet above the ground; an unusual site for nest; another nest, with three eggs, was about eight feet above the ground, in a Stinkwood tree; a third nest, containing four eggs, was four feet from the ground in a Prickly Banksia. There were nests everywhere; they were largely made of the green stalks of various Everlastings, and grasses as a foundation, and lined with fine dry roots; the nests were shallow, and measured about two and a half inches inside diameter; Nov. 27/12, young birds seen in nests; January 6/16, I re-visited Broome Hill for a few days, and found there was another visitation of these birds on a large scale.

Artamus cyanopterus. Dusky Wood-swallows were common about Broome Hill and the whole of the South-west. The following are breeding notes:—Feb. 12/06, recently fledged young seen; Nov. 11/06 and Dec. 11/06, two nests, with three and four eggs, respectively; Dec. 15/07, young birds seen in a nest, about twenty feet above the ground at the end of a White Gum limb; many fledged birds seen about this date and through January, 1908; Oct. 1-Nov. 1/08, many nests with fresh eggs, three or four, seen; Nov. 25/08, nest with four fresh eggs; Dec. 12/11, newly fledged young seen near Lake Muir; Oct. 27/12, nest found, completed, and ready for eggs; Feb. 16/19, saw immature birds being fed by parents at Broome Hill; Jan. 4/22, shot a recently fledged young at Cape Naturaliste. These birds seem migratory to a great extent, occurring mostly in the summer months.

Grallina cyanoleuca. Magpie-Larks (locally called Mudlarks) were more numerous in the immediate vicinity of Broome Hill than any other place where I have seen them. After the young birds are strong on the wing, in the early part of the year (January-February), all go together in flocks, of which I have seen some up to thirty in number, and they roost together in tall trees. It was a common sight to see these birds feeding in the little township of Broome Hill; they do not seem to occur in the dense forest country

*See plate 23, top right picture.

of the South-West. March 24/10, I saw a few of these birds in Albany township feeding on the edge of the harbour, close to the Residency and other houses there. The townspeople were remarking upon them, not having seen them before; March 17/19, I saw a few at Lake Muir, and Mr. A. F. Muir called my attention to them, as he said they were the first he had ever seen. The breeding season is from August to November, four eggs being a full clutch. Many writers have remarked upon the large mud nests of these birds, being usually built near the end of an outstanding branch, and so are very conspicuous. My opinion is, that this is done to be out of the range of the dripping foliage above, in wet weather, as it would soften the mud nests. I have known these nests to collapse and fall during heavy rains. A pair of these neat and elegant birds frequented most of the stock tanks, rearing one or two broods from a nest built, or repaired, in the same tree, annually. Oct. 13/06, nest with four fresh eggs found; Sept. 28/07, nest with four eggs; Aug. 18/11, bird sitting on her eggs, the young birds left the nest on Sept. 18; a second lot of eggs were laid in the above nest, the young birds left the nest on Dec. 12/11; Oct. 11/06, young birds were heard in a nest; Oct. 10/08, saw some fully fledged young, and again on Oct. 18/08, I saw the parent birds feeding young in a nest very high in a White Gum tree, and young were heard in the same nest until Nov. 17; Nov. 5/10, fledged young seen; Dec. 19/11, a brood of young seen, just leaving their nest.

Neositta pileata broomei. South-West Black-capped Sittellas are common about Broome Hill and through the South-West. Occasionally there seemed to be a "wave" of them, and on April 9/10 many small parties were seen, three to six in each party; Oct. 8/12, recently fledged young seen; Jan., 1922, for a few days about the middle of this month, I saw great numbers in the heavy timber near Cape Naturaliste. I have no breeding data.

Climacteris rufa. Rufous Treecreepers were common about Broome Hill, where the prevailing large timber is White Gum. Oct. 7/06, found a nest containing two eggs, much incubated; Oct. 30/07, recently fledged young seen; Sept. 29/08, having seen one of these birds, on two or three previous days, emerge from a hole about fifteen feet above the ground, in a White Gum tree, I cut the trunk open, which was hollow to the ground, but found neither nest nor eggs, so I concluded the bird had been feeding in the dark; Oct. 8/08, found a nest only four feet above the ground, in the hollow spout of a York Gum tree; it was about a foot in from the aperture, and was mostly made of dry grass with some sheep's wool for lining, with a few feathers, amongst which were some red ones from a Rosella, and green from Yellow-collared Parrots. There was one fresh egg in the nest. Sept. 19/10, cut into a hollow York Gum tree, from which I had seen Treecreepers emerge on several previous dates, but found only a few dry Jam tree leaves inside; Sept. 25/10, observed recently-fledged young on the Pallinup River; Oct. 10/12, got two slightly incubated eggs from a nest in a White Gum. Two eggs in a clutch was the most observed by me, and in both cases they were somewhat incubated, so apparently two is the full clutch.

Climacteris rufa obscura. The type of the Allied Rufous Tree-creeper was obtained at the Warren River, and this sub-species is the form that prevails in the Jarrah and Red Gum forests of the coastal districts in the South-West, where its sombre plumage is more protective against the dark, and usually charred, tree-trunks, than the lighter colour of the preceding form would be. Birds were observed at Albany, Lake Muir, Warren River, Blackwood River (at Augusta), Margaret and Collie Rivers. They were all of this dark form. Jan. 11/12, I came upon a family party of

recently fledged young, with parent birds, on the south side of Albany Harbour.

Zosterops gouldi. Green-backed Silver-eyes were abundant, and much disliked by orchardists for the grapes and other soft fruits that they destroy by probing with their sharp bills. They are generally called Silver-eyes or Greenies. Oct. 7/06, found a nest with two fresh eggs (Broome Hill); Jan. 10/10, two small young seen in nest at Albany; Oct. 18/10, many Silver-eyes breeding now (Broome Hill); Nov. 13/02, nest with three fresh eggs at Margaret River; Feb. 14/16, noticed many of these birds feeding on some small orange-coloured berries in scrub close to the beach at Busselton.

Pardalotus ornatus westralensis. Westralian Red-tipped Pardalotes were generally distributed through the South-West area. In March, 1922, they were numerous about Broome Hill and twenty-five miles to the east of there; Dec. 29/11, noted a pair of adults carrying food to young in nesting cavity in a Blue Gum tree at Albany; the hole was about fifteen feet above the ground; Dec. 11/02, noticed young in a nest near Busselton.

Pardalotus punctatus whitlocki. Western Spotted Pardalotes were most plentiful in the Karri forests of the extreme South-West, as about the Warren River and Denmark (Wilson's Inlet), and I noted them in February-March, 1905, as being rather numerous in the Blue Gum trees about Albany; March 11/10, I took one on the Pallinup River, east of Broome Hill, and on July 3/11, saw a few at Lake Muir, and obtained one for identification.

Melithreptus lunulatus chloropsis. Western White-naped Honeyeaters are very common through the South-West, but are not nearly so plentiful around Broome Hill as in the more heavily timbered districts. Dec. 16/02, I observed a pair of these birds feeding a fledged Pallid Cuckoo near Busselton.

Melithreptus brevirostris leucogenys. Western Brown-headed Honeyeater.—Mr. Milligan obtained and described the type of this bird on the Stirling Ranges. They were not uncommon about Broome Hill, but I cannot say how far they occur to the west. I have obtained specimens near Kellerberin, 150 miles north of Broome Hill. In Feb., 1916, I saw many about Broome Hill, and also in the scrubs to the east.

Acanthorhynchus superciliosus wilsoni. Southern White-browed Spinebills were common, and when the dwarf *Melaleuca* and other shrubs were in bloom, they sometimes swarmed, as I have seen them do about Albany, and also on a scrubby ridge at Broome Hill. I cannot define the range of the species and sub-species; and have no breeding data respecting either.

Glyciphila melanops westernensis. Western Tawny-crowned Honeyeaters were fairly common around Broome Hill, and the scrubby sandplains east of there, also on coastal scrubs on the South-West coast, but are not usually seen in large timber. Jan. 14/07, two incubated eggs in nest at Broome Hill; Feb. 3/07, two fresh eggs seen in nest at Broome Hill; July 26/08, a pair seen building, Broome Hill; Jan. 19/10, nest found at Albany with two fresh eggs; Oct. 11/10, small young seen in nest at Broome Hill; Feb. 17/12, unusually large numbers seen about Broome Hill; Feb. 16/05, young birds seen in nest at Albany; Feb. 20/05, nest with two eggs at Albany, and another, the same, Feb. 23/05. The nests are usually about three or four feet above the ground in a bush.

Stigmatops indistincta. Brown Honeyeaters were observed about Broome Hill and in most of the south-western districts, but were never seen in any numbers. Sept. 18/10, I shot one at Broome Hill that contained eggs almost fully formed.

Meliphaga leucotis woolundra. The type of the Woolundra White-eared Honeyeater was obtained by me near Woolundra on March 28/22. Another specimen was also obtained in the same locality, and presented to the Perth Museum. Only a few of these birds were seen, and they were very wild, keeping mostly to the tops of the tallest Salmon Gum trees. In 1903 the late Mr. A. W. Milligan, in company with C. P. Conigrave, obtained, on the Wongan Hills, specimens of a White-eared Honeyeater that he described as new, in "Emu," Vol. III., p. 226, as *Ptilotis novae-norciae*. The Wongan Hills are ninety miles north-west from Woolundra.

Meliphaga virescens broomei. The Broome Hill Singing Honeyeater was not common around Broome Hill, and was very seldom seen in the extreme South-West coastal districts, which is curious, as it is plentiful about the Swan River, and from there right through the Mid- and North-West, in the form of other sub-species; Oct. 15/05 was the first date when I heard its familiar notes at Broome Hill, and on Aug. 26/06 I shot a pair for examination. Feb. 17/07, saw a recently fledged bird; Dec. 11/02, found a nest with three eggs near Busselton, and saw another pair feeding their fledged young; Dec 16/02, saw a pair of Singing Honeyeaters feeding a fledged Pallid Cuckoo, also near Busselton. On several occasions I found an egg of Pallid Cuckoo in nests of this Honeyeater.

Meliphaga cratitia stirlingi. Mountain Purple-gaped Honeyeaters were observed by me only about the scrubby sandplains to the east of Broome Hill, and in similar country adjoining the Pallinup River, about thirty-five miles south-east of Broome Hill. They are active birds, and have a pleasing song. Aug. 28/08, several were getting honey from the blooms of Marlock scrub, about twenty feet in height; Sept. 12/08, found a nest in a bush, about five feet above the ground, containing two eggs nearly hatching; Oct. 19/08, a pair of these Honeyeaters were brought to me that had been obtained east of Broome Hill, for identification; the female was evidently breeding; March 15/10, saw several recently-fledged young at Pallinup River; Oct. 2/10, found a nest containing two fresh eggs; it was built in a small *Melaleuca* bush, and was about three and a half feet above the ground, with Marlock scrub all round; in Feb., 1919, I saw many of these birds about Gnowangerup; March 7/22, found a nest with two fresh eggs, about three feet from the ground, suspended in a small bush on a scrubby sandplain, several miles east of Gnowangerup. The nest was rather deep, and beautifully made of fine dry grass and soft fibrous bark, and had several white cocoons of spiders stuck on outside. It was 2 inches deep, 2½ inches wide. The birds were laying out of season, as were others at that date, as heavy thunderstorms had recently passed over that district.

Meliphaga ornata wensleydalei. Mathews separated the inland form of the Yellow-plumed Honeyeater from the coastal sub-species. I have no note of having seen this bird in the extreme South-West coastal districts, and Milligan does not mention it in his paper on birds occurring about the Margaret River and Ellensbrook district. ("Emu," Vol. II., pp. 68-77). It seems to prefer open timbered country, as around Broome Hill, where these birds were common, especially in White Gum timber, also to the east of there, and I have seen some round Cranbrook. In habits, song, and lively movements, they much resemble *Meliphaga carteri* of the Mid-West area. They are late breeders, from these notes:—Nov. 23/05, nest with two fresh eggs; Nov. 15/06, nest with two fresh eggs; Dec. 23/06, nest with two fresh eggs; Feb., 1916, many recently fledged about Broome Hill; Feb., 1921, very few of these birds seen about Broome Hill, probably because there was very little White Gum bloom; Feb. 6/19, saw immature birds being fed by parents.

Meliornis novæ-hollandiæ longirostris. Western Yellow-winged Honeyeaters are one of the commonest birds in the coastal scrubs of the extreme South-West, and also about Broome Hill. They feed more in scrub than large timber; June 3/06, great numbers seen on a scrubby hill on my station; July 15/06, found several nests, with either eggs or young, on above hill; August 9/10, nest with two fresh eggs in White Gum "suckers"; July 23/11, small young seen in nest; Sept. 22/12, nest with two fresh eggs; March 12/19, noted still breeding at Collie; Jan. 3/22, many recently fledged young seen about Cape Naturaliste; Feb. 14/05, nest with two eggs at Albany.

Meliornis niger dulciei. Western White-cheeked Honeyeaters seem very local, both about Broome Hill and the coastal districts, but as they often feed in company with *M. n. longirostris*, can easily be overlooked unless their quite distinct notes are heard. July 26/08, saw one east of Broome Hill, carrying nesting material in its beak; April 8/19, several seen near Augusta, feeding in company with *M. n. longirostris*, on the honey in Banksia blossoms; Feb. 24/05, shot one near Albany, and others seen round there on other dates. They are always very shy and wary.

Myzantha flavigula clelandi. Western Yellow-throated Miner.—Mathews separated the Miner occurring round Broome Hill as the Dark Miner ("Nov. Zool.," Vol. XVIII., p. 418, 1912). I have no notes of having observed any out of that area, so the following breeding notes refer to there. I have seen a good many about Cranbrook, 25 miles south. Oct. 7/06, nest with four eggs, incubated; Dec. 27/06, saw fledged young; Feb. 3/07, found a nest with three fresh eggs; Nov. 2/07, found a nest with four fresh eggs; Oct. 10/08, found two nests, both with fresh eggs—one was in a Stinkwood tree; Nov. 2/08, found a nest with four fresh eggs; Aug. 21/12, nest with two eggs; Feb. 1922, saw great numbers at Broome Hill.

Anthochaera carunculata woodwardi. Western Red Wattle-birds were abundant round Broome Hill, and all through the South-West area, sometimes being seen in thousands, and their loud "hiccupping" and gurgling notes heard some distance. In April, 1919, I saw immense numbers of them feeding in the coastal scrubs at Busselton and to the west of there. These birds seem to congregate along the South-West coast in the summer. Two to three eggs is the usual clutch, and the following notes were made at Broome Hill:—Nests with eggs were found Oct. 18/05 (2 eggs), Dec. 11/06 (3), Oct. 11/08 (2 eggs), Nov. 25/08 (2), Oct. 9/10 (2), Oct. 21/10 (2), May 28/11 (3 fresh eggs), Aug. 21/12 (2), Dec. 1/12 (3 eggs just hatching). Fledged young first seen Oct. 11/08 and Oct. 20/12; small young in nest, Dec. 5/10.

Anthochaera chrysoptera lunulata. Little Wattle-birds were fairly common about Broome Hill, and more plentiful in the South-West coastal districts, especially during summer. They regularly feed in company with the above larger birds. July 15/06, nests with one egg each were seen at Broome Hill.

Acanthagenys rufogularis wei. Lake Way Spiny-cheeked Honeyeaters were only observed by me at Broome Hill on one occasion, March 28/11, when I saw a few at one of my stock tanks, and about the same date a neighbour brought me one for identification. Only one specimen having been obtained by me, I cannot be sure as to which of Mathews' sub-species it belonged—*wei*, Mid-West Australia, interior; or *flavacanthus*, Mid-West Australia, coastal.

Anthus australis bilbali. Western Pipits or Ground-Larks were common about Broome Hill, and all through the South-West on open or cleared ground; they extended their range as the timber was burnt off. The breeding season is protracted, and extends from August to January, as the following notes show:—Oct. 12/06,

nest with three incubated eggs at Broome Hill; Dec. 23/06, nest with three fresh eggs at Broome Hill; Sept. 4/08, Nov. 18/08, Nov. 25/08, nests found, each with three fresh eggs; Dec. 21/08, nest with incubated eggs; Jan. 20/10, young birds seen at Albany; Aug. 23/10, saw birds making nest; Oct. 9/10, nest with three eggs (Broome Hill); Aug. 21/12, nest with three eggs; Oct. 7/12, nest with two fresh eggs; Nov. 10/02, found a nest with three eggs.

Zonæginthus oculus. Red-eared Firetails were plentiful in the Paper-bark (*Melaleuca*) swamps round Albany, Denmark and the coastal swamps generally, but none was seen close to Broome Hill, which is not swamp country. I have seen a few at Lake Muir; also some in the dense scrub under Karri forest, near the Warren River, and some at the mouth of it. In March, 1916, and again in 1919, I saw several nests of the previous breeding seasons, built in bushes close to the edge of the road, and also round the edges of a large swamp near the Cape Leeuwin lighthouse; boys living there said they found eggs every year. The nests were very bulky for the size of the birds, and were made of fine grass and fibre, and partly domed in shape.

Taniopygia castanotis wayensis. Murchison Chestnut-eared Finches were rare visitors about Broome Hill, and I think were only driven there by very dry conditions prevailing farther to the north and east. They were fairly common for a short time about mid-Oct., 1911, which was a dry year. I saw a good many on Oct. 14/11, a few miles east of Broome Hill, and heard of others about twenty miles further east. Jan. 20/16, I obtained a specimen at Lake Muir, and these are the only records that I know for the whole of the South-West area.

Corvus coronoides perplexus. Southern Ravens (Aboriginal name, Warroong) were common in South-Western districts, including the Warren River locality, but for some reason were rarely seen about Broome Hill, during the first years of my residence there, and their appearances were always recorded in my note book; thus:—Oct. 19/05, saw the first Crow (six months after my arrival there); Jan. 26/06, heard a Crow; Feb. 11/07, eight Crows flew over; Aug. 1/07, four Crows flew over a neighbour's house (one mile distant); Aug. 18/08, two Crows flew past my house; Jan. 20/09, three Crows flew near the house; July 28/11, saw three Crows mobbing a Wedge-tailed Eagle; Oct. 1/12, saw a Crow at one of my stock tanks where it remained for about a month; March 17/10, saw a Crow at Cranbrook (25 miles south of Broome Hill); Feb. 14/19, several seen about Broome Hill, and in Feb., 1922, they were numerous, and the settlers there, as also in the South-West, were complaining of their numbers (since these birds had recently been protected), and the great damage they did to various kinds of orchard fruit. Crows (Ravens) were always noted on my many visits to Albany as being abundant. In March, 1910, I drove north from Albany through the Stirling Ranges to the Pallinup River (about sixty miles), and saw no Crows north of the Porongorup Hills (about 25 miles north of Albany). A mail driver, who drove me back to Broome Hill from the Pallinup River, and had been on that road for many years, told me that, many years previously, though Crows were so seldom seen about Broome Hill, there were generally a few to be seen at any time, in and about Katanning, a town of considerable size, twelve miles to the north of Broome Hill.

Strepera versicolor plumbea. Western Grey Bell-Magpies (Crow-Shrikes) were common about Broome Hill, and very plentiful all through the South-West, where they are invariably known as "Squeakers." The aboriginal name is "Bell." Oct. 3/07, young birds

heard in nest, in top twigs of a White Gum; Sept. 8/08, found a nest with two eggs, incubated, high up in a White Gum tree; the nest was small for the size of the birds; Nov. 1/08, saw some fledged young, and another fledged brood Nov. 4; Oct. 9/10, three fresh eggs found; Dec. 12/11, recently fledged young seen; Jan. 25/16, saw a recently fledged brood of young that flew with difficulty.

Cracticus torquatus leucopterus. White-winged Butcher-birds were fairly numerous about Broome Hill and most of the South-West districts, but none was observed by me about Augusta or the Margaret River; they are locally known as "Jackasses." Oct. 2/10, found a nest near the Pallinup River; it was situated about twelve feet above the ground and contained four incubated eggs; the female came off the nest and the male was seen, but would not come close; the nest was loosely made of twigs and lined with roots and fibre; Nov. 2/11, young birds in nest, almost full-grown; Aug. 21/12, a pair seen building nest; Jan. 28/22, I came upon a party of recently fledged young with parent birds in thick coastal scrub near Yallinup; the male bird flew straight at my face to within six feet, screaming loudly; March 23/11, found a dead Black and White Fantail that had been hung up by a Butcher-bird, which I frightened away from its victim. The Fantail's neck was jammed in the fork of a branch, and its body partly plucked. On other occasions I have seen the remains of a Fantail so situated, and the Butcher-birds seem to be partial to them; Oct. 10/12, a neighbour's wife told me at Broome Hill that she had hung two canaries in a cage under the house verandah, and hearing a noise there soon afterwards, ran out and found both the canaries dead in their cage. She took them out and laid them on the open palm of her hand, thinking that they might not both be dead, when the Butcher-bird that had attacked them swooped in under the verandah, and settled on her hand to seize one of the bodies.

Cracticus nigrogularis kalgoorli. Western Pied Butcher-birds were common about Woolundra, as well as *C. t. leucopterus*, which latter bird the Pied, or Black-throated variety, constantly fought and drove away from its own vicinity. The song of the Black-throated is very beautiful and rich in tone. I have seen none of them south of Woolundra.

Gymnorhina dorsalis. (Aboriginal, Toorakee, or Crowbardy). Varied-backed Magpies were, I think, more numerous in the immediate vicinity of Broome Hill than at any other place I visited. They are not found in dense forest country in the more South-Western area, excepting in the neighbourhood of a clearing and homestead, and in that respect seem to have become parasitical in their habits since the advent of settlement in the country, and resemble the English Sparrow (*Passer domesticus*), which is seldom found far from a house. In the course of my long residence in Western Australia (more than thirty years), I have had several illustrations of how Magpies have extended their range, with increased settlement; thus, on my first visit to Busselton in 1887, it was pointed out to me, as I drove along with Mr. R. Gale (one of the oldest settlers) from that town to the mouth of the Margaret River, that we should see Magpies until we reached the east side of the Carbadup River, but none on the other side of it, and it proved to be as he said, but in after years, as more land was cleared to the west, the Magpies followed there. In some cases the settlers obtained young Magpies and set them free at their new homesteads to give them a more "homely" appearance, and I must say that I consider Magpies, with their striking plumage, active habits, and varied notes, are very attractive, and the evening song of the male bird, usually uttered from the top of a tall tree just about sundown, is one

of the most beautiful that can be heard and is even richer in tone than its morning carol. As soon as my house was built near Broome Hill, some Magpies took up their abode close to it, and afterwards there were almost always about six pairs in the immediate vicinity, feeding close round and up to the back door, on scraps from the kitchen. These six pairs always had six nests within a quarter of a mile from the house. When the young were fledged, the adults brought them to the house, generally about the end of November or December, and fed them in the vicinity until the new year, when the number of those at the house came down to about twelve again of the adults, which, I think, drove away the fledglings, perhaps because twelve was the full feeding or "carrying capacity" of the homestead. I did, however, notice that one or two of these "outcasts" would venture back occasionally, and with quivering wings and open beak, appeal for food from some of the adults. On March 10/12, I saw an adult male feeding a fledgling of the previous year, and also on March 4/19. The nests were usually built high in trees, often White Gums, and not easy to reach, as they were often near the end of a horizontal branch, and White Gum branches, when green (growing), are apt to break off without warning. The following breeding notes are from Broome Hill:—First eggs for that year seen Sept. 14/06, Sept. 3/08 (2 eggs incubated), Sept. 18/10, Aug. 21/12. Young first noted in nests:—Sept. 25/06, Oct. 8/07 (almost fledged) Aug. 21/08, Oct. 6/09 (fledglings left nest), Oct. 5/10 (young in nest), Nov. 12/10 (young still in another nest, they left it Nov. 22); Nov. 14/11, young still in nest; Sept. 5/08, birds of last year still in brown immature plumage, but moulting, and very ragged, and shedding wing and tail feathers; Oct. 5/09, birds of last year very ragged, and moulting; adults brought fledged young to house, Dec. 10/10, Dec. 9/12; May 4/11, Magpies fighting and pairing, and starting evening song again; Feb. 25/12, young birds of last year, beginning to sing; Jan. 24/22, saw quite recently fledged young at Busselton; Oct. 29/10, four birds of 1909 hatching, have been about house since Aug. 26, and are in full moult; March 8/10, when driving from Albany to Magitup, on Pallinup River, I saw the first Magpie at the Porongorup Hills (25 miles from Albany). Magpies did not occur about Albany in 1905, and none was seen on my last visit there in Nov., 1921. None was seen about Augusta, on any of my visits there. Oct. 25/07, saw a caged Magpie at Katanning that was all of a beautiful silver-grey plumage, and was told that it was one of a brood, all the same color, from the Buchanan River (a tributary of the Blackwood). Feb. 14/17, I saw a tame Magpie, of the previous year, that had all white plumage, with pale fleshy bill and legs. The irides were blue with a faint tinge of pink; it was then about five months old. Magpies do an immense amount of good, by destroying various harmful grubs and insects, and are useful near a chicken-run, as they will combine to drive away a marauding Hawk, and I have seen a party of them attack and mob a Wedge-tailed Eagle in such a determined way that it left the premises; but they also have some mischievous and destructive habits, and in April, 1912, they attacked and ate a great many of my grapes. At first, I thought it was the work of Parrots, and covered the vines with wire netting, but on going to them next morning I found the whole house party of Magpies under the netting and enjoying the grapes. When at Busselton, in February, 1916, the Magpies ate nearly all the figs off the trees at the house where I was staying, and one day, when there, one of the men was "dibbling" grains of maize along some rows, to grow future feed for the cows, but I saw the Magpies following him up, and digging up with their beaks, and eating the grain, almost as fast as it was sown.

(Finis.)

NATIONAL MUSEUM OF THE UNITED STATES



Grey Butcherbird (*Crathichus torquatus*) at nest.

Photo. by L. G. Chandler, R.A.O.U.

Camera Craft

The Grey Butcher-bird.—I often wonder what songbird would be classed as Australia's best if members of the R.A.O.U. and kindred societies were to vote upon the subject. At present I champion the cause of the Grey Butcher-bird as Victoria's premier song-bird. Apart from certain harsh hunting notes, the varied notes of this bird are exceedingly sweet. Butcher-birds are common at Red Cliffs (N.W. Vic.), and in the spring of 1922 I spent several hours with my camera taking pictures of the birds "at home." The nest was situated in the fork of a Mallee-gum (*Eucalyptus*) about twelve feet from the ground, and for convenience in working I carried to the spot a pair of steps. An uninitiated person chancing to meet a stranger in dense Mallee-scrub struggling under the burden of a camera, tripod and steps, not to mention sundry ropes, field-glasses and tomahawk strung about his person, may have had cause for alarm. Fortunately, the Butcher-birds chose to accept such an apparition as part of the scenery, and, after a little preliminary fussing, went about their domestic duties quite unconcerned. A quaint and pleasing habit of fluffing the feathers and jerking the head while singing is characteristic of this species. Both sexes assist in feeding the young, and the male is very attentive to his mate, frequently feeding her while she is on the nest. At times when he approaches with food she will leave the nest and meet him. The offering is accepted with quivering wings and querulous cry, after the manner of a young bird. Dragon-flies figure largely in the diet of the nestling, and one of my photographs shows the bird with a dragon-fly in its beak. While very young, the nestlings appear to be fed entirely on an insect diet. I hoped to visit this nest later and obtain photographic records and notes of the food supplied to the young when fully fledged, but it proved to be my first and last opportunity for the season to go "bush" with the camera.—L. G. CHANDLER, R.A.O.U., Red Cliffs.

The Efficiency of Camouflage.—I think most Australian bird photographers have so little leisure to devote to the hobby that the practice of anything in the way of elaborate camouflage is out of the question. Personally, I find that my photography is confined to a little more than one half-day a week, and that, if I spent much time in erecting hiding tents, and so on, the day would be almost spent before I had made an exposure. Recently, however, I have disguised the camera somewhat, and have noted the results carefully. My first plan, that of fastening suitable foliage, by means of rings, to the green focussing cloth, appeared to give no advantage worth mentioning. In fact, the drooping of the wilted leaves over the lens accounted for more than one failure. I am also convinced that covering the nickel and brass fittings on the camera front had little effect on

the trustfulness of the subjects. The necessary bending aside of branches around the nest disturbs some birds, but I am certain that the stare of the lens is the most fruitful cause of long waits and bitter disappointments. After long observation, I have come to the conclusion that it is the moving reflection of the bird itself in the lens which attracts its attention, and so often causes a perceptible "shock" when the subject first approaches the point overlooked by the camera. Unfortunately, the lens is the one portion of the apparatus which cannot be disguised efficiently. Nevertheless, it is possible to effect some little disguise by fitting a cylindrical hood over the lens mount, and allowing it to project as far as is possible without cutting off the corners of the picture. I had proof of the advantage of the hood when Mr. Lawrence and I spent half of one miserable, stormy day in attempting to photograph the Crested Shrike-Tit (*Falcunculus frontatus*). One of the party had captured a well-grown young bird high up in the trees, and we imprisoned him on the ground beneath a small sapling. Mr. Lawrence focussed his camera upon one outstanding branch, while I used another. For hours, the birds flew back and forth, until eventually, the male bird ventured into our sapling. Two or three times he hopped in the direction of Mr. Lawrence's branch, but changed his mind suddenly when he saw the lens, which was without a hood. On each occasion he used the only other suitable branch, which was mine. He could not see my lens until he was actually perched before it. When he did see it he left hurriedly. Twice he beat me, but once I was too quick for him. These were the only chances he gave, and circumstances combined to prevent the picture from being a good one. I shall be interested to learn from other photographers the extent to which they have used camouflage, and the measure of benefit they have derived from it.—R. T. LITTLEJOHNS, R.A.O.U., Melbourne.

* * *

Southern Warbler.—Some weeks ago, whilst searching for nesting birds at Flora Hill, on the outskirts of Bendigo, I was attracted by the strange but rather pleasing song of a bird new to me. I experienced some difficulty in locating the singer, but later found it to be the Southern Warbler (*Gerygone culicivora*). After several visits to the locality I discovered that there was a pair of birds, and at length observed them carrying nesting material. The rapidity with which they darted from tree to tree, however, made them difficult to follow, and their inconspicuous colour added to my difficulties.

Eventually I discovered the nest about three feet from the ground in a Eucalyptus bush. It was hanging from a fork at the extreme end of a branch, and was not then completed. The nest was built in the shape of a long oval with a tail beneath.



The Crested Shrike-tit (male).

Photo. by R. T. Littlejohns, R.A.O.U.



Little Grass-bird at Nest.

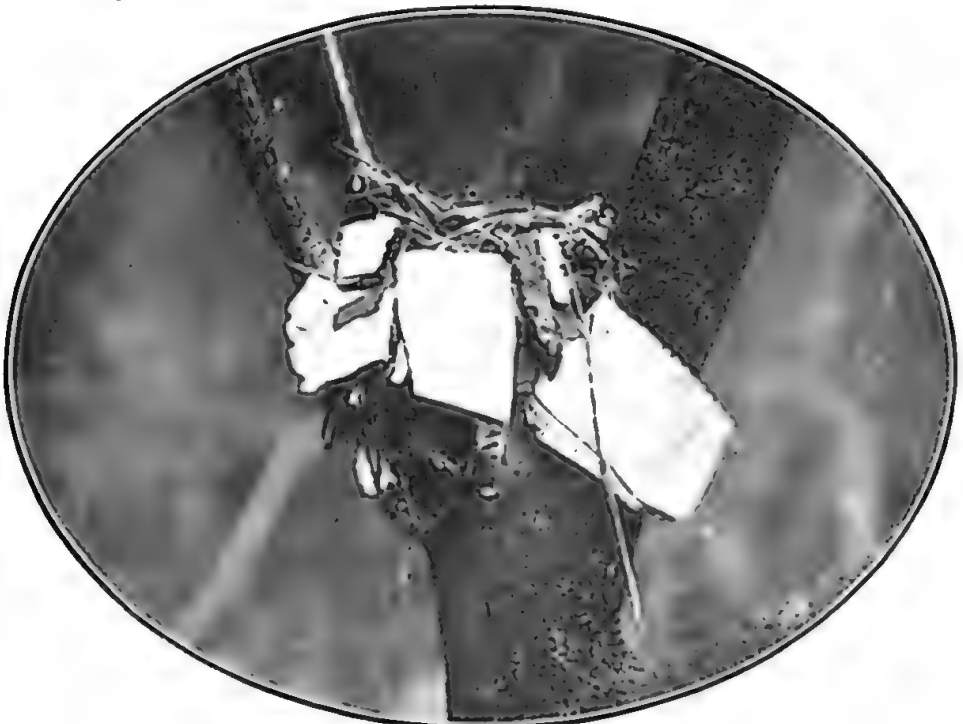
Photo. by Marc Cohn, R.A.O.U.

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White-tailed or Southern Warbler feeding young Cuckoo.
Photo. by G. Morris, R.A.O.U.



Nest of Yellow Robin, showing an unusual camouflage. Note the pieces
of newspaper suspended from the nest.
Photo. by Norman Chaffer, R.A.O.U.

material used was for the most part fine brownish-coloured bark, while the cocoons of spiders were fastened to the outside. Feathers were used as lining.

Along with the three eggs of the Warbler was one of a Cuckoo, and the young Cuckoo was the sole survivor when I next visited the nest. I was able to secure a picture of this young bird being fed by its foster-parents.

The birds I found most difficult to photograph because of the rapidity of their movements. In time they became accustomed to my presence, and allowed me to approach within a few feet of them at the nest.—G. MORRIS, R.A.O.U., Quarry Hill, Bendigo.

* * *

Unusual Nest of the Yellow Robin. — This curious nest of the Yellow Robin (*Eopsaltria australis*) nest was found by Mr. H. Wolstenholme, R.A.O.U., near his home at Wahroonga, Sydney. It was placed on a sheoak (*Casuarina*) quite close to a much used beach, and was very conspicuous. Evidently, in this case, the pieces of newspaper hanging around the nest were used more for ornament than camouflage. The paper was placed on the one side only, the other side having the usual strips of bark suspended from it.

* * *

The Little Grass-bird. —Early in October, 1921, while photographing Reed-Warblers on an island in Lake Weerona, Bendigo, I was puzzled by a monotonous whistle. I looked towards the bank of the lake several times for the small boy I felt sure was there.

In November, 1922, I heard the same whistle again, but this time traced it to a bird, which I had mistaken for a sparrow, although its smaller size, habit of flying low, and rapid movements of the wings puzzled me. It was the Little Grass-bird (*Megalurus gramineus*) of the accompanying photograph.

On several occasions I watched this bird from the bank of the lake. When I mimicked its call, it would answer and fly into a tree near me. It seemed to visit one clump of Pampas grass more than any other, and eventually my patience was rewarded by seeing it carry three duck's feathers to this clump. I rowed to the island, where I easily found the nest, which contained three young birds.

Owing to poor light, I paid several visits to the island before I secured a good photograph.

The young ones were reared, and the parents built another nest about a foot from the previous site. By Christmas Day the second brood was hatched, and I was fortunate in securing better pictures than previously.—MARC COHN, R.A.O.U., Bendigo.

Stray Feathers

The Origin of Some Bird Names.—The name *Regulus* was originally applied to the Wren in pre-Linnæan days, and took its origin from the fable, in which the birds agreed to accept the highest flier as their king. The Eagle was about to be proclaimed, when it was discovered that the Wren was perched upon his back, and was therefore made king of the birds. Linnæus first applied the name specifically to the Gold-crest as *Motacilla regulus*, perhaps mistaking it for the bird of the fable, or perhaps on account of the gold crest being likened to a crown. Cuvier, in the early part of last century, made a new genus for the bird, taking the specific name, and using it generically, as was so often done in those days. The name *Geobasileus*, meaning King of the Earth, was apparently applied from the association of ideas. The Genus *Acanthiza* was made by Vigors and Horsfield in a paper read before the Linnæan Society on June 21, 1825, and January 17, 1826, which was published in the Transactions of the Society in 1827. In this paper a number of new genera were formed, many still in use, but some obsolete. In each case the derivation of the name is given, the Greek being translated into Latin; no English rendering is given. They give the origin of *Acanthiza* as *Acantheon-dumetum-zao-vivo*. Riddle's Latin Dictionary gives *dumetum* as meaning a place set with bushes, a thicket, a brake. The meaning of the name is therefore Scrub Dweller, and has nothing to do with the beak.—(Dr.) A. M. MORGAN, 206 North Terrace, Adelaide, S.A.

* * *

Colour-Changes in the Silver Gull.—The change which the bill of the Silver Gull (*Larus nova-hollandiæ*) undergoes each year, from red to black, appears to correspond fairly closely in regard to time, with the plumage-change of the male Blue Wren [*Emu*, Vol. XXII., page 323]. On 17th February there was a male Wren skulking in a native shrub at Mersey Bluff, in the throes of his moult; the beautiful cobalt-blue of the crown, cheeks, and mantle had become faded and dirty, and the whole plumage had a most disreputable appearance, of which the bird seemed quite conscious. On 26th of same month a party of Silver Gulls was floating on the water near the rock on which I sat; all members of the party had bills either black or, in some cases, midway between red and black, the change to dark being not yet complete. By July, and, in many cases, I think, before that month, these bills will all be red once more, and the Blue Wren, seen only a few yards from the same rock, will have assumed his beautiful nuptial attire. I can find no reference to this seasonal change in the Gull in the Australian books which I have, yet it must be widely known. If there is a change in the tint of the legs also, it must be far less pronounced than in the bills, for the legs of almost all the individuals of the group noticed were red, and are that colour also in winter. The one

or two members who seemed to have darker limbs were probably young birds of the season which had not yet attained the brighter tint. The Gulls were busily engaged, while floating about, in picking some small objects off the water-surface, probably shrimp-like crustaceans, which have been very plentiful of late off this coast.—H. STUART DOVE, F.Z.S., W. Devonport, Tas.

* * *

Birds of a National Park.—In contrast with colder countries, there is no month of the year in Australia when one wild bird or another is not breeding. The present time, however—say, from February to June—is the slackest period for the bird-observer; and, because of this, we were doubly pleased on Sunday last (February 3) to find several birds' nests in active use at the Waterfall end of Sydney's National Park. Prettiest of all was the picture created by a Rufous Fantail that had a dainty nest—shaped like a wine-glass with the bottom broken off—placed in a tree beside a creek, on a small branch about four feet from the ground. The familiar Grey (White-shafted) Fantail is a graceful figure on its nest; to this grace the Red Fantail adds beauty—a really pleasing medley of white, black, and rufous on throat and head, blending into brown on the back, which in turn gives way to a broad expanse of rufous. And the dominating tail (which can be expanded as wide as any fan) folded and extended beyond the margin of the nest, seems to harmonise most amiably with the quaint "tail" that extends below the cup of the nest. Other nests noted were one of the cup-shaped, mossy homes of the cheery Black-faced Flycatcher, and two of the bulky cradles of the sprightly Yellow-throated Scrub-wren. Called by settlers in the north the "Devilbird" and "Black-nest Bird," the Scrub-wren of the yellow throat is notable for its fondness for dark gullies, where it suspends dark rootlets and twigs in untidy masses from vines or branches, usually overhanging watercourses. For all their unkempt appearance, however, these black nests are very cosy within; the babies in each of the two nests examined were very comfortable and healthy.

There was once (and probably still is) a common impression that the Lyre-bird, admittedly a master mocker, has to "take the knock" in respect of one particular bird-call, to wit, the laughter of the Kookaburra. It may be, of course, that some Lyre-birds have failed in attempting this (and good observers have testified to the failures, through only hearing the quaint cackle on rare occasions). At all events, we had abundant evidence that the Lyre-bird is not only able to mimic the Kookaburra, but can render that extraordinary vocal jumble created by two Jacks chortling together. Nor was this cleverness confined to one Lyre-bird; two birds, miles apart, performed the same feat. It was, indeed, a pleasant surprise to find the *Menuras* so voiceful in February; their best efforts are made in the early spring. Listening to one bird for five minutes or so, we jotted down the names of fourteen different birds which it mimicked

perfectly. There were the wailing of both the White and Black Cockatoos, the screech of the Crimson Parrot, the shout of the Currawong (Pied Bell-magpie), the cackle of the Kookaburra, the crack of the Whip-bird, and the calls of the Bower-bird, Grey Thrush, Pilot-bird, Butcher-bird, Brush Wattle, Leather-head, and Yellow-faced and Yellow-eared Honeybirds. To these another Lyre-bird added, later, imitations of the Scrub-wren, Black-faced Flycatcher, and Golden-breasted Whistler. In a third case the rollicking Lyre-bird was seen to be a female—proving, as Mr. Tom Tregallas has done in Victoria, that this lady is just as capable a vocalist, if not so consistent, as her regal mate with the lyre-like tail.—A. H. CHISHOLM, C.F.A.O.U., in *Daily Telegraph*, Sydney.

* * *

New and Strange Scavenger Moth, discovered by Ornithological Collector.—*Emu*, xxiii., p. 146, contains a note by Mr. J. R. Kinghorn, Zoologist, Australian Museum, on an entirely new and large venomous snake. *Oxyuranus maclennani* (Kinghorn), discovered by Mr. Wm. McLennan while collecting on the Cape York Peninsula for Mr. H. L. White.

On the same expedition Mr. McLennan discovered an extraordinary Moth living in the nests of the Golden-shouldered Parrot (*Psephotus chrysopterygius*).^{*} Mr. White handed the material to Dr. A. Jeffries Turner, Brisbane, who deemed the discovery so important that he communicated his description and deductions to the Entomological Society of London,^{**} naming the insect *Necossiosynoecca scatophaga* (literal meaning, "dung-eater, living nestling birds"). The nests of the Parrot are excavations in the termitaria or white-ant-hills. These nests are devoid of lining. McLennan found the larvæ in nearly every nest examined, and was struck by the cleanness of the nests and the absence of excreta from the young birds. On further investigation, he observed the larvæ actually devouring excreta as soon as they were voided, even cleaning the feet and feathers of the young. The grubs (stout, greyish and about 32 mm. in length) were present in large numbers in silken galleries matted together with larvæ, dust and fragments of earth in the bottom of the nest. Dr. Turner states:—"These habits appear very remarkable. Not all *lepidopterous* larvæ feed on foliage, not even on vegetable matter. It would be possible to compile a considerable list of eccentric feeders, but among these I doubt if any are more curious than the species I here describe."

It would appear that the field is still open to the enterprising collecting Naturalist. In the trip just mentioned, in addition to many ornithological novelties obtained, a new reptile, 9 feet long, "undoubtedly the most dangerous snake in Australia," and a

^{*}See White, *Emu* XXII., p. 110.

^{**}Trans. Ent. Soc., Lond., 1923, p. 170.

wonderful *lepidopterous* scavenger, have been added to scientific knowledge.—A. J. CAMPBELL, F.A.O.U., Box Hill, Vic.

Reviews

["Willis Island."—A Storm Warning Station in the Coral Sea, by John King Davis, F.R.G.S., author of "With the *Aurora* in the Antarctic," Director of Navigation for the Commonwealth of Australia. With an Introductory Chapter by Griffith Taylor, D.Sc., B.E., B.A., with 37 photographs and 12 maps and line drawings. Critchley Parker, Melbourne, 376 Flinders-lane; 1923.]

This small but important work is a record of simple facts, written in a breezy style. It is historical, reminiscent and informative.

Willis Island is 250 miles off the coast of North-eastern Queensland. To this isolated spot Capt. Davis set out with 15 willing assistants to form a meteorological station, and did it in six months. He incidentally established an ornithological observing station, and was the first bird observer there. In the appendix, "Short Notes on Birds frequenting Willis Island" are given, while such notes as the following are taken from the body of the work:—

March 22nd (1922).—The Noddies are here in great numbers. This is the nesting season. They perch on the bushes, which have now grown to a height of 3½ feet. Some are busy transporting shells, bits of dry coral, grass, etc., as material for the nests; others remain perched on the bushes—superintending! During the afternoon the greater number settle on the beach, leaving only a few nest-builders at work.

March 24th.—The Terns keep up a ceaseless chatter on quiet nights. At times, it is difficult to get to sleep with such a din.

April 2nd.—The whole island is littered with nests and eggs, those of the Noddies being the most numerous.

April 4th.—I found the nests of some fresh arrivals, Crested Terns (*Sterna bergi*). The Sooty Terns are mustering in great force during the nesting season.

April 8th.—The following birds are nesting at present:—White Masked Gannet, Red-legged Gannet, Terns, Noddies, Crested Terns, and Brown Gannets. The birds are the attraction here, although the ceaseless screaming is not "an added charm," but it is a real pleasure to see the wild bird in its natural environment and to see the means provided by Nature to enable the young to reach maturity.

April 9th.—I have just returned (9 p.m.) from a moonlight walk round the beach. On the northern side of the island it was just black with birds. There must have been some thousands.

* * *

["How to Study Birds: A Practical Guide for Amateur Bird Lovers and Camera-Hunters," by Herbert K. Job, Member of the American Ornithologists' Union, etc. Published by The Macmillan Company, New York].

This useful and interesting volume, from the pen of an author already well-known to Nature-lovers, is a striking indication of the trend of modern bird-observation. In its pages we find a

judicious admixture of pleasant anecdote and practical instruction in the art of hunting harmlessly, while, as a statement of the aims and views of a popular bird-student, the opening chapter is especially worth reading. Other chapters are devoted to the identification of wild birds, to their songs and to the subject of migration.

The author has made the fullest use of the photographic method of popularising his subject, and the sixty excellent pictures which illustrate the book are obviously the result of much patient and painstaking work. The advice given in the chapters which deal with bird photography is both explicit and sound.

The volume is handy in size, well bound in cloth, and contains 270 pages. Our copy is from Messrs. Angus and Robertson Ltd., Castlereagh-st., Sydney. The price is 8s., post free.

Conversazione

It may be true that good wine needs no bush, but it is equally true that judicious advertising is often desirable. This was strikingly shown in the record attendance at the *Conversazione* at the National Museum, Melbourne, on March 11th. A well-written paragraph in the daily papers drew folk in embarrassing numbers, and when the seating accommodation was engaged fully half the number had to remain standing. Amongst those who succumbed to the attraction of the bill of fare, "Bird-life in Central Australia," were His Excellency the Governor, Lady Stradbroke, and a large party from Government House.

Mr. A. G. Campbell began by giving a synopsis of the work done by successive exploring expeditions in Central Australia, which geographical term was taken to include all the interior of the continent, with a rainfall of less than 10 inches annually. He made good use of a series of maps, and, as the lecture proceeded, one began to get a clearer conception of the conditions prevailing, and to realise against what tremendous odds Stuart, Eyre, Giles and the other explorers pitted themselves.

Mr. A. J. Campbell, who followed, lost little time in indicating the nature and extent of the bird-life of the region under review. Lying on the table before him were specimens of many birds taken by the recent H. L. White Expedition under F. Lawson Whitlock, the well-known field ornithologist, and the oral description was supplemented by the exhibition of the bird itself.

Finishing his talk sooner than his auditors would have desired, Mr. Campbell introduced Mr. Keartland, who enjoys the distinction of having been a member of several of these exploring expeditions, in one of which two men and several camels perished under the strain of the privations endured. The audience listened with eager interest as the speaker recalled some of his experiences. These were not all of a sombre character. Mr. Keartland's racy, graphic, and often humorous descriptions served to bring the fascinating interior much nearer to us. He, too, made good use of the specimens available.

When the addresses were concluded and many questions had been answered, Mr. Mattingley and Mr. Gates voiced the thanks of the R.A.O.U. to His Excellency and Lady Stradbroke for their attendance. In his reply, the Governor showed that he takes a keen and intelligent interest in matters concerning the preservation of the native fauna.

Dr. Leach (President, R.A.O.U.) acted as chairman in his usual efficient style, and expressed the feelings of all the members of the R.A.O.U. present, when he spoke of the strong encouragement so large an attendance afforded.

J. CROSS, Hon. Sec., R.A.O.U.

Obituary

FREDERIC CHARLES MORSE.

By the death of Mr. F. C. Morse, of "Banarway," Mogil Mogil, N.S.W., which occurred after a short illness, on January 26th last, at Collaroy, a seaside resort near Sydney, where he was spending a holiday with his family, the Union lost a member who could ill be spared. He leaves a widow, three sons and a daughter.

The late Mr. Morse was born at "Balala" Station, near Armidale, on July 10th, 1874. He was educated at All Saints' College, Bathurst, where he won distinction as a scholar and in many branches of sport.

On leaving school, Mr. Morse went on the land, and for many years managed "Bundy," a well-known property near Coonamble. Afterwards he bought "Coocalla," at Garah, where he lived until last year, when he sold out and purchased "Banarway," at Mogil Mogil.

When quite a boy Mr. Morse began the career of an enthusiastic nature-lover, devoting most of his time to the study of birds. Being a keen and reliable observer, a splendid bushman, a daring climber and a clever photographer, his contributions to *The Emu* and other journals have added considerably to the knowledge of Australian ornithology.

In bird photography, Mr. Morse excelled; the many beautiful pictures which have appeared in *The Emu* indicate his skill in that branch of his life's hobby. His observations on the "Birds of the Watercourse" (Moree) and other articles written under the nom-de-plume "Lima-colae," were mainly responsible for having that area declared a sanctuary, and his egg collection, replete with full data, ranks amongst the best private collections in Australia.

A man of quiet, unassuming manner, a devoted husband and father, always generous and hospitable, he endeared himself to all those fortunate enough to know him. Whether in camp or in the scrub, Mr. Morse was a delightful companion and a typical Australian. He was a valued and esteemed member of the R.A.O.U., and will be greatly missed by all.

Correspondence.

89 Castlereagh Street, Sydney,
4th March, 1924.

The Editors, *The Emu*.

Sirs,—We sincerely regret that, owing to unforeseen circumstances, we have been compelled to abandon the publication of Cayley's *Birds of Australia*. Will you be kind enough to allow us to announce in your columns that we shall begin to issue *Australian Bird Biographies* in parts, at the beginning of 1925? The scientific and literary staff employed on the former book will be responsible for the new one, which will be illustrated by coloured plates depicting typical eggs of nearly every species, and a large number of engravings from nature photographs.

Yours,

ANGUS & ROBERTSON LTD.

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Notes

CHANGE OF ADDRESS.

The members of the R.A.O.U. will please note that the address of our head-quarters is now 376 Flinders Street, Melbourne.

COPIES OF "THE EMU" FOR SALE.

FOR SALE Bound Copies of "The Emu" from the commencement, Vols. i to 20 inclusive, and Vol. 22, in first-class order (part of Library of late Col. T. M. Evans, V.D.). Offers to purchase will be received by the Executor, c/o Messrs. Dobson, Mitchell & Allport, Solicitors, 111 Macquarie Street; Hobart.

CONGRESS OF 1924.

The Queensland members have recommended that the next Annual Congress will be held in Queensland from the 1st to the 15th September. Rockhampton has been selected for the meetings, and arrangements are now being made in regard to the Camp-out which will follow. Arrangements will also be made for lectures in Brisbane. Full particulars will appear in our next issue, and it is hoped that the attendance will be a record one.

ABOUT MEMBERS.

General Sir Charles Ryan, hon. member and ex-president R.A.O.U., has sailed for England. His return to Australia is problematical.

At the last (March) annual meeting of the British Ornithological Union, Mr. C. L. Barrett (Victoria) and Mr. N. W. Cayley (N.S.W.) were elected members.

The date of publication was April 4th, 1924.



Museum Victoria



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